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CHAPTER

MENSURATION

EXERCISE

TYPE A

1. If the length of the diagonal AC of a square ABCD is 5.2 cm, then the area of the square is :
(a) 15.12 sq. cm (b) 13.52 sq. cm
(c) 12.62 sq. cm (d) 10.00 sq . cm

2. The length of the diagonal of a square is 'a' cm. Which of the following represents the area of the square (in sq. cm)?
(a) 2a (b) $\frac{a}{\sqrt{2}}$
(c) $a^2/2$ (d) $a^2/4$

3. The breadth of a rectangular hall is three-fourth of its length. If the area of the floor is 768 sq. m., then the difference between the length and breadth of the hall is:
(a) 8 metres (b) 12 metres
(c) 24 metres (d) 32 metres

4. Find the length of the largest rod that can be placed in a room 16m long, 12m broad and $10\frac{2}{3}m$ high,
(a) 123 m (b) 68 m
(c) $22\frac{2}{3}m$ (d) $22\frac{1}{3}m$

5. Between a square of perimeter 44 cm and a circle of circumference 44 cm, which figure has larger area and by how much?
(a) Square, 33cm^2
(b) Circle, 33 cm^2
(c) Both have equal area.
(d) circle ,495 cm^2

6. The perimeter of a square and a circular field are same. If the area of the circular field is 3850 sq meter. What is the area (in m^2) of the square ?
(a) 4225 (b) 3025
(c) 2500 (d) 2025

7. The perimeter of the top of a rectangular table is 28m., whereas its area is 48m^2. What is the length of its diagonal?
(a) 5 m (b) 10 m
(c) 12 m (d) 12.5 m

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8. The diagonal of a square is $4\sqrt{2}$ cm. The diagonal of another square whose area is double that of the first square is:
(a) $8\sqrt{2}$ cm (b) 16 cm
(c) $\sqrt{32}$ cm (d) 8 cm

9. The diagonal of a square A is (a +b). The diagoanal of a square whose area is twice the area of square A is
(a) 2(a +b) (b) 2(a+b)^2
(c) $\sqrt{2}$(a–b) (d) $\sqrt{2}(a+b)$

10. The length of a rectangular garden is 12 metres and its breadth is 5 metres. Find the length of the diagonal of a square garden having the same area as that of the rectangular garden?
(a) $2\sqrt{30}$ m (b) $\sqrt{13}$ m
(c) 13 m (d) $8\sqrt{15}$ m

11. The areas of a square and a rectangle are equal . The length of the rectangle is greater than the length of any side of the square by 5 cm and the breadth is less by 3 cm. Find the perimeter of the rectangle.
(a) 17 cm (b) 26 cm
(c) 30 cm (d) 34 cm

12. The perimeter of a rectangle is 160 metres and the difference of two sides is 48 metres. Find the side of a square whose area is equal to the area of this rectangle?
(a) 32m (b) 8m
(c) 4m (d) 16m

13. The perimeter of two squares are 24 cm and 32 cm. The perimeter (in cm) of a third square equal in area to the sum of the areas of these squares is:
(a) 45 (b) 40
(c) 32 (d) 48

14. A wire when bent in the form of a square encloses an area of 484 sq. cm. What will be the enclosed area when the same wire is bent into the form of a circle? (Take $\pi = \frac{22}{7}$)
(a) 125 cm^2 (b) 230 cm^2
(c) 550 cm^2 (d) 616 cm^2

15. The difference of the areas of two squares drawn on two line segments of different lengths is 32sq. cm, Find the length of the greater line segment if one is longer than the other by 2 cm.
(a) 7cm (b) 9 cm
(c) 11cm (d) 16 cm

16. A took 15 sec. to cross a rectangular field diagonally walking at the rate of speed 52m/min and B took the same time to cross the same field along its sides walking at the rate speed 68 m/min. The area of the field is:
(a) 30 m^2 (b) 40 m^2
(c) 50 m^2 (d) 60 m^2

17. The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is

(a) 1520 m^2 (b) 2420 m^2
(c) 2480 m^2 (d) 2520 m^2

18. The area (in m^2) of the square which has the same perimeter as a rectangle whose length is 48 m and is 3 times its breadth is:

(a) 1000 (b) 1024
(c) 1600 (d) 1042

19. The perimeter of five squares are 24 cm, 32 cm,40 cm,76cm and 80 cm respectively. The perimeter of another square equal in area to sum of the areas of these squares is:

(a) 31 cm (b) 62 cm
(c) 124 cm (d) 961 cm

20. There is a rectangular tank of length 180 m and breadth 120 m in a circular field, If the area of the land portion of the field is 40000 m^2, what is the radius of the field? (Take $\pi = \frac{22}{7}$)

(a) 130 m (b) 135 m
(c) 140 m (d) 145 m

21. The length of a rectangular hall is 5m more than its breadth. The area of the hall is 750m^2. The length of the hall is :

(a) 15 m (b) 22.5 m
(c) 25 m (d) 30 m

22. A cistern 6 m long and 4 m wide contains water up to a depth of 1 m 25 cm. The total area of the wet surface is

(a) 55 m^2 (b) 53.5 m^2
(c) 50 m^2 (d) 49 m^2

23. If the length and breadth of a rectangle are in the ratio 3 : 2 and its perimeter is 20 cm, then the area of the rectangle (in cm^2) is

(a) 24 cm^2 (b) 36 cm^2
(c) 48 cm^2 (d) 12 cm^2

24. The perimeter of a rectangle and a square are 160 m each. The area of the rectangle is less than that of the square by 100 sq m. The length of the rectangle is

(a) 30 m (b) 60 m
(c) 40 m (d) 50 m

25. A path of uniform width runs round the inside of a rectangular field 38 m long and 32 m wide, If the path occupies 600m^2, then the width of the path is

(a) 30 m (b) 5 m
(c) 18.75 m (d) 10 m

26. The perimeter of the floor of a room is 18 m. What is the area of the walls of the room, If the height of the room is 3 m ?

(a) 21 m^2 (b) 42 m^2
(c) 54 m^2 (d) 108 m^2

27. A copper wire is bent in the shape of a square of area 81 cm^2. If the same wire is bent in the form of a semicircle, the radius (in cm) of the semicircle is (take $\pi = \frac{22}{7}$)

(a) 126 (b) 14
(c) 10 (d) 7

28. Water flows into a tank which is 200 m long and 150 m wide through a pipe of cross- section 0.3m × 0.2m at 20 km/hour. Then the time (in hours) for the water level in the tank to reach 8 m is

(a) 50 (b) 120
(c) 150 (d) 200

29. A street of width 10 metres surrounds from outside a rectangular garden whose measurement is 200 m × 180 m. The area of the path (in square metres) is

(a) 8000 (b) 7000
(c) 7500 (d) 8200

30. The area of the square inscribed in a circle of radius 8 cm is

(a) 256 sq. cm (b) 250 sq. cm
(c) 128 sq. cm (d) 125 sq. cm

31. Area of square with diagonal $8\sqrt{2}$ cm is

(a) 64 cm^2 (b) 29 cm^2
(c) 56 cm^2 (d) 128 cm^2

32. If the area of a rectangle be ($x^2+7x+10$) sq. cm, then one of the possible perimeter of it is

(a) ($4x+14$) cm (b) ($2x+14$) cm
(c) ($x+14$) cm (d) ($2x+7$) cm

33. If the perimeter of a square and a rectangle are the same. then the area P and Q enclosed by them would satisfy the condition

(a) $P < Q$ (b) $P \leq Q$
(c) $P > Q$ (d) $P = Q$

34. A cube of edge 6 cm is painted on all sides and then cut into unit cubes. The number of unit cubes with no sides painted is

(a) 0 (b) 64
(c) 186 (d) 108

35. A kite is in the shape of a square with a diagonal 32 cm attached to an equilateral triangle of the base 8 cm. Approximately how much paper has been used to make it ? (Use $\sqrt{3}$ = 1.732)

(a) 539.712 cm^2 (b) 538.721 cm^2
(c) 540.712 cm^2 (d) 539.217 cm^2

36. A lawn is in the form of a rectangle having its breadth and length in the ratio 3 : 4. The area of the lawn is $\frac{1}{12}$ hectare. The breadth of the lawn is

(a) 25 metres (b) 50 metres
(c) 75 metres (d) 100 metres

37. The area of a rectangle is thrice that of a square. The length of the rectangle is 20 cm and the breadth of the rectangle is $\frac{3}{2}$ times that of the side of the square. The side of the square, (in cm) is

(a) 10 (b) 20
(c) 30 (d) 60

38. The length and breadth of a rectangular field are in the ratio 7 : 4. A path 4 m wide running all around outside has an area of 416 m^2. The breadth (in m) of the field is

(a) 28 (b) 14
(c) 15 (d) 16

39. How many tiles, each 4 decimeter square. will be required to cover the floor of a room 8 m long and 6 m broad?

(a) 200 (b) 260
(c) 280 (d) 300

40. A godown is 15 m long and 12 m broad. The sum of the area of the floor and the ceiling is equal to the sum of areas of the four walls. The volume (in m^3) of the godown is :

(a) 900 (b) 1200
(c) 1800 (d) 720

41. Length of a side of a square inscribed in a circle is $a\sqrt{2}$ units. The circumference of the circle is

(a) $2\pi a$ units (b) πa units

(c) $4\pi a$ units (d) $\frac{2a}{\pi}$ units

42. The perimeter and length of a rectangle are 40 m and 12 m respectively. Its breadth will be

(a) 10 m (b) 8 m

(c) 6 m (d) 3 m

43. If each edge of a square be doubled. then the increase percentage in its area is

(a) 200% (b) 250%

(c) 280% (d) 300%

44. A circle is inscribed in a square of side 35 cm. The area of the remaining portion of the square which is not enclosed by the circle is

(a) 962.5 cm^2 (b) 262.5 cm^2

(c) 762.5 cm^2 (d) 562.4 cm^2

(CPO 21–06–2015 Evening)

45. If the side of a square is $\frac{1}{2}(x+1)$ units and its diagonal is $\frac{3-x}{\sqrt{2}}$ units, then the length of the side of the square would be

(a) $\frac{4}{3}$ units (b) 1 unit

(c) $\frac{1}{2}$ units (d) 2 units

(CGL Mains 12–04–2015)

46. A rectangular carpet has an area of 120 m^2 and a perimeter of 46 metre. The length of its diagonal is:

(a) 17 metre (b) 21 metre

(c) 13 metre (d) 23 metre

(SSC LDC 15–11–2015, Morning)

47. The length of a room is 3 metre more than its breadth. If the area of a floor of the room is 70 $metre^2$, then the perimeter of the floor will be-

(a) 14 metre (b) 28 metre

(c) 34 metre (d) 17 metre

(SSC LDC 20–12–2015, Evening)

TYPE B

48. The area of a sector of a circle of radius 5 cm, formed by an arc of length 3.5 cm is :

(a) 8.5 cm^2 (b) 8.75 cm^2

(c) 7.75 cm^2 (d) 7.50 cm^2

49. The radius of a circular wheel is 1.75 m. The number of revolutions it will make in travelling 11 km is $\left(use\ \pi = \frac{22}{7}\right)$:

(a) 800 (b) 900

(c) 1000 (d) 1200

50. The area (in sq. cm) of the largest circle that can be drawn inside a square of side 28 cm is :

(a) 17248 (b) 784

(c) 8624 (d) 616

51. The area of the ring between two concentric circles, whose circumference are 88 cm and 132 cm, is

(a) 78 cm^2 (b) 770 cm^2

(c) 715 cm^2 (d) 660 cm^2

52. The diameter of a toy wheel is 14 cm, What is the distance travelled by it in 15 revolutions?

(a) 880 cm (b) 660 cm

(c) 600 cm (d) 560 cm

53. A can go round a circular path 8 times in 40 minutes. If the diameter of the circle is increased to 10 times the original diameter, the time required by A to go round the new path once travelling at the same speed as before is:

(a) 25 min (b) 20 min

(c) 50 min (d) 100 min

54. The base of a triangle is 15 cm and height is 12 cm. The height of another triangle of double the area having the base 20 cm is

(a) 9cm (b) 18 cm

(c) 8 cm (d) 12.5 cm

55. If the area of a triangle with base 12 cm is equal to the area of square with side 12 cm. the altitude of the triangle will be

(a) 12 cm (b) 24 cm

(c) 18 cm (d) 36 cm

56. The sides of a triangle are 3cm, 4 cm and 5 cm. The area (in cm^2) of the triangle formed by joining the mid points of this triangle is:

(a) 6 (b) 3

(c) $\frac{3}{2}$ (d) $\frac{3}{4}$

57. Three circles of radius 3.5 cm each are placed in such a way that each touches the other two. The area of the portion enclosed by the circles is

(a) 1.975 cm^2 (b) 1.967 cm^2

(c) 19.68 cm^2 (d) 21.22 cm^2

58. Four equal circles each of radius 'a' units touch one another. The area enclosed between them ($\pi = \frac{22}{7}$). In square units, is

(a) $3a^2$ (b) $\frac{6a^2}{7}$

(c) $\frac{41a^2}{7}$ (d) $\frac{a^2}{7}$

59. The area of the greatest circle inscribed inside a square of side 21 cm is (Take $\pi = \frac{22}{7}$)

(a) $351\frac{1}{2}$ cm^2 (b) $350\frac{1}{2}$ cm^2

(c) $346\frac{1}{2}$ cm^2 (d) $347\frac{1}{2}$ cm^2

60. From a point in the interior of an equilateral triangle, the perpendicular distance of the sides are $\sqrt{3}$ cm $2\sqrt{3}$ cm and $5\sqrt{3}$ cm. The perimeter (in cm) of the triangle is

(a) 64 (b) 32

(c) 48 (d) 24

61. The perimeter of a triangle is 30 cm and its area is 30 cm^2. If the largest side measures 13 cm, What is the length of the smallest side of the triangle?

(a) 3 cm (b) 4 cm

(c) 5 cm (d) 6 cm

62. Find the diameter of a wheel that makes 113 revolutions to go 2 km 26 decameters.

(Take $\pi = \frac{22}{7}$)

(a) $4\frac{4}{13}$ m (b) $6\frac{4}{11}$ m

(c) $12\frac{4}{11}$ m (d) $12\frac{8}{11}$ m

63. A path of uniform width surrounds a circular park, The difference of internal and extenal circumference of this circular path is 132 metres. Its width is:

(Take $\pi = \frac{22}{7}$)

(a) 22 m (b) 20 m

(c) 21 m (d) 24 m

64. Four equal sized maximum circular plates are cut off from a square paper sheet of area 784 sq. cm. The circumference of each plate is (Take $\pi = \frac{22}{7}$)

(a) 22 cm (b) 44 cm
(c) 66 cm (d) 88 cm

65. The circum-radius of an equilateral triangle is 8 cm. The in- radius of the triangle is
(a) 3.25 cm (b) 3.50 cm
(c) 4 cm (d) 4.25 cm

66. Three coins of the same size (radius 1 cm) are placed on a table such that each of them touches the other two. The area enclosed by the coins is

(a) $\left(\frac{\pi}{2} - \sqrt{3}\right)$ cm² (b) $\left(\sqrt{3} - \frac{\pi}{2}\right)$ cm²

(c) $\left(2\sqrt{3} - \frac{\pi}{2}\right)$ cm² (d) $\left(3\sqrt{3} - \frac{\pi}{2}\right)$ cm²

67. The area of the greatest circle, which can be inscribed in a square whose perimeter is 120 cm, is:

(a) $\frac{22}{7} \times (15)^2$ cm² (b) $\frac{22}{7} \times \left(\frac{7}{2}\right)^2$ cm²

(c) $\frac{22}{7} \times \left(\frac{15}{2}\right)^2$ cm² (d) $\frac{22}{7} \times \left(\frac{9}{2}\right)^2$ cm²

68. A circle is inscribed in a square, An equilateral triangle of side $4\sqrt{3}$ cm is inscribed in that circle. The length of the diagonal of the square (in cm) is

(a) $4\sqrt{2}$ (b) 8

(c) $8\sqrt{2}$ (d) 16

69. From a point within an equilateral triangle, perpendiculars drawn to the three sides are 6 cm, 7 cm and 8 cm respectively, the length of the side of the triangle is:
(a) 7 cm (b) 10. 5 cm

(c) $14\sqrt{3}$ cm (b) $\frac{14\sqrt{3}}{3}$ cm

70. In an isosceles triangle, the measure of each of equal sides is 10 cm and the angle between them is 45°, then area of the triangle is

(a) 25 cm² (b) $\frac{25}{2}\sqrt{2}$ cm²

(c) $25\sqrt{2}$ cm² (d) $2\sqrt{3}$ cm²

71. If the difference between the circumference and diameter of a circle is 30 cm, then the radius of the circle must be
(a) 6 cm (b) 7 cm
(c) 5 cm (d) 8 cm

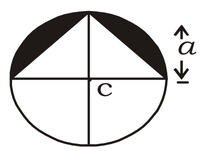
72. The base and altitude of a right angled triangle are 12 cm and 5 cm respectively. The perpendicular distance of its hypotenuse from the opposite vertex is

(a) $4\frac{4}{13}$ cm (b) $4\frac{8}{13}$ cm

(c) 5 (d) 7 cm

YEAR : 2007

73. The area of the shaded region in the figure given below is



(a) $\frac{a^2}{2}\left(\frac{\pi}{2} - 1\right)$ sq. units

(b) $a^2(\pi - 1)$ sq. units

(c) $a^2\left(\frac{\pi}{2} - 1\right)$ sq. units

(d) $\frac{a^2}{b^2}(\pi - 1)$ sq. units

74. The area of a circle is increased by 22 cm², if its radius is increased by 1 cm. The original radius of the circle is
(a) 6 cm (b) 3.2 cm
(c) 3 cm (d) 3.5 cm

75. The area of the largest circle, that can be drawn inside a rectangle with sides 148 cm. by 14 cm is
(a) 49 cm² (b) 154 cm²
(c) 378 cm² (d) 1078 cm²

76. A circle is inscribed in an equilateral triangle of side 8 cm. The area of the portion between the triangle and the circle is
(a) 11 cm² (b) 10.95 cm²
(c) 10 cm² (d) 10.50 cm²

77. In a triangular field having sides 30m, 72m and 78m, the length of the altitude to the side measuring 72m is :
(a) 25 m (b) 28 m
(c) 30 m (d) 35 m

78. If the perimeter of a right-angled isosceles triangle is $\left(4\sqrt{2} + 4\right)$ cm, the length of the hypotenuse is;
(a) 4 cm (b) 6 cm
(c) 8 cm (d) 10 cm

79. The circumference of a circle is 11 cm and the angle of a sector of the circle is 60°. The area of the sector is

(use $\pi = \frac{22}{7}$)

(a) $1\frac{29}{48}$ cm² (b) $2\frac{29}{48}$ cm²

(c) $1\frac{27}{48}$ cm² (d) $2\frac{27}{48}$ cm²

80. If the difference between areas of the circumcircle and the incircle of an equilateral triangle is 44 cm², then the area of the triangle is

(Take $\pi = \frac{22}{7}$)

(a) 28 cm² (b) $7\sqrt{3}$ cm²
(c) $14\sqrt{3}$ cm² (d) 21 cm²

81. If the area of a circle inscribed in a square is 9π cm², then the area of the square is
(a) 24 cm² (b) 30 cm²
(c) 36 cm² (d) 81 cm²

82. The sides of a triangle are 6 cm, 8 cm and 10 cm. The area of the greatest square that can be inscribed in it, is
(a) 18 cm² (b) 15 cm²

(c) $\frac{2304}{49}$ cm² (d) $\frac{576}{49}$ cm²

83. The length of a side of an equilateral triangle is 8 cm. the area of the region lying between the circumcircle and the incircle of the triangle is

(use $\pi = \frac{22}{7}$)

(a) $50\frac{1}{7}$ cm² (b) $50\frac{2}{7}$ cm²

(c) $75\frac{1}{7}$ cm² (d) $75\frac{2}{7}$ cm²

84. The perimeter (in metres) of a semicircle is numerically equal to its area (in square meters). The length of its diameter is (Take $\pi = \frac{22}{7}$)

(a) $3\frac{3}{11}$ metres (b) $5\frac{6}{11}$ metres

(c) $6\frac{6}{11}$ metres (d) $6\frac{2}{11}$ metres

85. One acute angle of a right angled triangle is double the other. If the length of its hypotenuse is 10 cm, then its area is

(a) $\frac{25}{2}\sqrt{3}$ cm^2 (b) 25 cm^2

(c) $25\sqrt{3}$ cm^2 (d) $\frac{75}{2}$ cm^2

86. If a triangle with base 8 cm has the same area as a circle with radius 8 cm, then the corresponding altitude (in cm) of the triangle is

(a) 12π (b) 20π

(c) 16π (d) 32π

87. The measures (in cm) of sides of a right angled triangle are given by consecutive integers. its area (in cm^2) is

(a) 9 (b) 8

(c) 5 (d) 6

88. The area of a right-angled isosceles triangle having hypotenuse $16\sqrt{2}$ cm is

(a) 144 cm^2 (b) 128 cm^2

(c) 112 cm^2 (d) 110 cm^2

89. A 7 m wide road runs outside around a circular park, whose circumference is 176 m. the area of the road is : (use $\pi = \frac{22}{7}$)

(a) 1386 m^2 (b) 1472 m^2

(c) 1512 m^2 (d) 1760 m^2

90. The four equal circles of radius 4 cm drawn on the four corners of a square touch each other externally. Then the area of the portion between the square and the four sectors is

(a) $9(\pi - 4)$ sq. cm

(b) $16(4 - \pi)$ sq. cm

(c) $99(\pi - 4)$ sq. cm

(d) $169(\pi - 4)$ sq. cm

91. The length of each side of an equilateral triangle is $14\sqrt{3}$ cm. The area of the incircle (in cm^2) is

(a) 450 (b) 308

(c) 154 (d) 77

92. A copper wire is bent in the form of an equilateral triangle and has area $121\sqrt{3}$ cm^2. If the same wire is bent into the form of a circle. the area (in cm^2) enclosed by the wire is

(take $\pi = \frac{22}{7}$)

(a) 364.5 (b) 693.5

(c) 346.5 (d) 639.5

93. At each corner of a triangular field of sides 26 m ,28 m and 30 m, a cow is tethered by a rope of length 7m, the area (in m^2-) ungrazed by the cows is

(a) 336 (b) 259 (c) 154 (d) 77

94. ABC is an equilateral triangle, P and Q are two points on $\overline{AB}$ and $\overline{AC}$ respectively such that $\overline{PQ} \parallel \overline{BC}$. If $\overline{PQ}$ =5 cm, then area of $\triangle APQ$ is :

(a) $\frac{25}{4}$ sq. cm (b) $\frac{25}{\sqrt{3}}$ sq. cm

(c) $\frac{25\sqrt{3}}{4}$ sq. cm (d) $25\sqrt{3}$ sq. cm

95. In $\triangle ABC$, O is the centroid and AD, BE, CF are three medians and the area of $\triangle AOE$ = 15 cm^2 then area of quadrilateral BDOF is

(a) 20 cm^2 (b) 30 cm^2

(c) 40 cm^2 (d) 25 cm^2

96. A straight line parallel to the base BC of the triangle ABC intersects AB and AC at the points D and E respectively. If the area of the $\triangle ABE$ be 36 sq. cm. then the area of the $\triangle ACD$ is

(a) 18 sq.cm (b) 36 sq. cm

(c) 18 cm (d) 36 cm

97. The length of two sides of an isosceles triangle are 15 and 22 respectively. What are the possible values of perimeter?

(a) 52 or 59 (b) 52 or 60

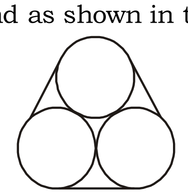
(c) 15 or 37 (d) 37 or 29

98. The wheel of a motor car makes 1000 revolutions in moving 440 m . The diameter (in metre) of the wheel is

(a) 0.44 (b) 0.14

(c) 0.24 (d) 0.34

99. Three circles of diameter 10 cm each are bound together by a rubber band as shown in the figure.



the length of the rubber band (in cm) if it is stretched is

(a) 30 (b) $30 + 10\pi$

(c) 10π (d) $60+20\pi$

100. In an equilateral triangle ABC of side 10 cm, the side BC is trisected at D & E. Then the length (in cm) of AD is

(a) $3\sqrt{7}$ (b) $7\sqrt{3}$

(c) $\frac{10\sqrt{7}}{3}$ (d) $\frac{7\sqrt{10}}{3}$

101. The perimeter of a triangle is 40cm and its area is 60 cm^2. If the largest side measures 17 cm, then the length (in cm) of the smallest side of the triangle is

(a) 4 (b) 6

(c) 8 (d) 15

102. If the numerical value of the perimeter of an equilateral triangle is $\sqrt{3}$ times the area of it, then the length of each side of the triangle is

(a) 2 units (b) 3 units

(c) 4 units (d) 6 units

103. Each side of an equilateral triangle is 6 cm. Find its area?

(a) $9\sqrt{3}$ sq. cm (b) $6\sqrt{3}$ sq. cm

(c) $4\sqrt{3}$ sq. cm (d) $8\sqrt{3}$ sq. cm

104. The length of three medians of a triangle are 9 cm, 12 cm and 15 cm. The area (in sq. cm) of the triangle is

(a) 24 (b) 72

(c) 48 (d) 144

105. If the length of each side of an equilateral triangle is increased by 2 units, the area is found to be increased by $3 + \sqrt{3}$ square unit. The length of each side of the triangle is

(a) $\sqrt{3}$ units (b) 3 units

(c) $3\sqrt{3}$ units (d) $3\sqrt{2}$ units

106. What is the area of the triangle whose sides are 9cm,10cm and 11 cm ?

(a) 30 cm^2 (b) 60 cm^2

(c) $30\sqrt{2}$ cm^2 (d) $60\sqrt{2}$ cm^2

107. The area of an isosceles triangle is 4 square units, If the length of the unequal side is 2 units, the length of each equal side is

(a) 4 units (b) $2\sqrt{3}$ units

(c) $\sqrt{17}$ units (d) $3\sqrt{2}$ units

108. What is the area of a triangle having perimeter 32 cm, one side 11 cm and difference of other two sides 5 cm?

(a) $8\sqrt{30}$ cm^2 (b) $5\sqrt{35}$ cm^2

(c) $6\sqrt{30}$ cm^2 (d) $8\sqrt{2}$ cm^2

109. The radii of two circles are 5 cm and 12 cm. The area of a third circle is equal to the sum of the area of the two circles. The radius of the third circle is:

(a) 13 cm (b) 21 cm
(c) 30 cm (d) 17 cm

110. The area of a circle inscribed in a square of area 2m^2 is

(a) $\frac{\pi}{4}$ m^2 (b) $\frac{\pi}{2}$ m^2

(c) π m^2 (d) 2π m^2

111. Three circles of radii 4 cm, 6 cm and 8 cm touch each other pair wise externally. The area of the triangle formed. by the line-segments joining- the centres of the three circles is

(a) $144\sqrt{13}$ sq. cm

(b) $12\sqrt{105}$ sq. cm

(c) $6\sqrt{6}$ sq. cm

(d) $24\sqrt{6}$ sq. cm

112. Two circles with centre A and B and radius 2 units touch each other externally at 'C', A third circle with centre 'C' and radius '2' units meets other two at D and E. Then the area of the quadrilateral ABED is

(a) $2\sqrt{2}$ sq. units

(b) $3\sqrt{3}$ sq. units

(c) $3\sqrt{2}$ sq. units

(d) $2\sqrt{3}$ sq. units

113. If the length of each median of an equilateral triangle is $6\sqrt{3}$ cm, the perimeter of the triangle is

(a) 24 cm (b) 32 cm
(c) 36 cm (d) 42 cm

114. A gear 12 cm in diameter is turning a gear 18 cm in diameter. When the smaller gear has 42 revolutions. how many has the larger one made?

(a) 28 (b) 20
(c) 15 (d) 24

115. A circle and a rectangle have the same perimeter. The sides of the rectangle are 18 cm and 26 cm. The area of the circle is (Take $\pi = \frac{22}{7}$)

(a) 125 cm^2 (b) 230 cm^2
(c) 550 cm^2 (d) 616 cm^2

116. A circle is inscribed in a square whose length of the diagonal is $12\sqrt{2}$ cm. An equilateral triangle is inscribed in that circle. The length of the side of the triangle is

(a) $4\sqrt{3}$ cm (b) $8\sqrt{3}$ cm

(c) $6\sqrt{3}$ cm (d) $11\sqrt{3}$ cm

117. The area (in sq. unit) of the triangle formed in the first quadrant by the line $3x + 4y = 12$ is

(a) 8 (b) 12
(c) 6 (d) 4

118. The height of an equilateral triangle is 15 cm. the area of the triangle is

(a) $50\sqrt{3}$ sq. cm

(b) $70\sqrt{3}$ sq. cm

(c) $75\sqrt{3}$ sq. cm

(d) $150\sqrt{3}$ sq. cm

119. The area of an equilateral triangle is $9\sqrt{3}$ m^2. The length (in m) of the median is

(a) $2\sqrt{3}$ (b) $3\sqrt{3}$

(c) $3\sqrt{2}$ (d) $2\sqrt{2}$

120. 360 sq. cm and 250 sq. cm are the area of two similar triangles. If the length of one of the sides of the first triangle be 8 cm , then the length of the corresponding side of the second triangle is

(a) $6\frac{1}{5}$ cm (b) $6\frac{1}{3}$ cm

(c) $6\frac{2}{3}$ cm (d) 6 cm

121. The perimeter of an isosceles triangle is 544 cm and each of the equal sides is $\frac{5}{6}$ times the base . What is the area (in cm^2) of the triangle ?

(a) 38172 (b) 18372
(c) 31872 (d) 13872

122. The altitude drawn to the base of an isosceles triangle is 8 cm and its perimeter is 64 cm. The area (in cm^2) of the triangle is

(a) 240 (b) 180
(c) 360 (d) 120

123. Three circles of radius a, b, c touch each other externally. The area of the triangle formed by joining their centre is

(a) $\sqrt{(a+b+c)abc}$

(b) $(a+b+c)\sqrt{ab+bc+ca}$

(c) $ab + bc + ca$

(d) None of the above

124. A circle is inscribed in an equilateral triangle and a square is inscribed in that circle. The ratio of the areas of the triangle and the square is

(a) $\sqrt{3}:4$ (b) $\sqrt{3}:8$

(c) $3\sqrt{3}:2$ (d) $3\sqrt{3}:1$

125. If area of an equilateral triangle is a and height b, then value of $\frac{b^2}{a}$ is:

(a) 3 (b) $\frac{1}{3}$

(c) $\sqrt{3}$ (d) $\frac{1}{\sqrt{3}}$

126. If $\triangle ABC$ is similar to $\triangle DEF$ such that BC = 3 cm, EF = 4 cm and area of $\triangle ABC$ = 54 cm^2, then the area of $\triangle DEF$ is :

(a) 66 cm^2 (b) 78 cm^2
(c) 96 cm^2 (d) 54 cm^2

127. The area of two similar triangles ABC and DEF are 20cm^2 and 45 cm^2 respectively. If AB =5 cm, then DE is equal to

(a) 6.5 cm (b) 7.5 cm
(c) 8.5 cm (d) 5.5 cm

128. C_1 and C_2 are two concentric circles with centre at O, Their radii are 12 cm and 3 cm, respectively. B and C are the point of contact of two tangents drawn to C_2 from a point A lying on the circle C_1. Then, the area of the quadrilateral ABOC is

(a) $\frac{9\sqrt{15}}{2}$ sq . cm

(b) $12\sqrt{15}$ sq. cm

(c) $9\sqrt{15}$ sq. cm

(d) $6\sqrt{15}$ sq. cm

129. From a point P which is at a distance of 13 cm from centre O of a circle of radius 5 cm in the same plane, a pair of tangents PQ and PR are drawn to the circle Area of quadrilateral PQOR is
(a) 65 cm^2 (b) 60 cm^2
(c) 30 cm^2 (d) 90 cm^2

130. A circular road runs around a circular ground. If the difference between the circumference of the outer circle and the inner circle is 66 meters, the width of the road is:
(Take $\pi = \frac{22}{7}$)
(a) 10.5 metres (b) 7 metres
(c) 5.25 metres (d) 21 metres

131. A person observed that he required 30 seconds less time to cross a circular ground along its diameter than to cover it once along the boundary. If his speed was 30 m/ minutes. then the radius of the circular ground is (Take $\pi = \frac{22}{7}$):
(a) 5.5 m (b) 7.5 m
(c) 10.5 m (d) 3.5 m

132. A horse is tied to a post by a rope. If the horse moves along a circular path always keeping the rope streched and describes 88 metres when it has traced out 72° at the centre, the length of the rope is
(Take $\pi = \frac{22}{7}$)
(a) 70 m (b) 75 m
(c) 80 m (d) 65 m

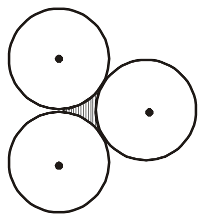
133. Three sides of a triangular field are of length 15 m, 20m and 25 m long respectively. Find the cost of sowing seeds in the field at the rate of 5 rupees per sq. m
(a) ₹300 (b) ₹600
(c) ₹750 (d) ₹150

134. A chord of length 30 cm is at a distance of 8 cm from the centre of a circle. The radius of the circle is:
(a) 17 cm (b) 23 cm
(c) 21 cm (d) 19 cm

135. The radius of the incircle of a triangle whose sides are 9 cm, 12 cm and 15 cm is
(a) 9 cm (b) 13 cm
(c)3 cm (d) 6 cm

136. The ratio of inradius and circumradius of a square is :
(a) $1:\sqrt{2}$ (b) $\sqrt{2}:\sqrt{3}$
(c) 1 : 3 (d) 1 : 2

137. Three circles of equal radius 'a' cm touch each other. The area of the shaded region is :



(a) $\left(\frac{\sqrt{3}+\pi}{2}\right)a^2$sq. cm
(b) $\left(\frac{6\sqrt{3}-\pi}{2}\right)a^2$sq. cm
(c) $\left(\sqrt{3}-\pi\right)a^2$sq. cm
(d) $\left(\frac{2\sqrt{3}-\pi}{2}\right)a^2$sq. cm

YEAR : 2014

138. ABC is a right angled triangle. B being the right angle. Mid- points of BC and AC are respectively B' and A' Area of $\triangle$A'B'C is
(a) $\frac{1}{2}\times$ area of $\triangle ABC$
(b) $\frac{2}{3}\times$ area of $\triangle ABC$
(c) $\frac{1}{4}\times$ area of $\triangle ABC$
(d) $\frac{1}{8}\times$ area of $\triangle ABC$

139. $\angle ACB$ is an angle in the semicircle of diameter AB = 5 cm and AC : BC = 3 : 4. The area of the triangle ABC is
(a) $6\sqrt{2}$ sq. cm (b) 4 sq. cm
(c) 12 sq. cm (d) 6 sq. cm

140. If the lengths of the sides AB, BC and CA of a triangle ABC are 10 cm, 8 cm and 6 cm respectively and If M is the mid-point of BC and $MN \parallel AB$ to cut AC at N. then area of the trapezium ABMN is equal to
(a) 18 sq. cm (b) 20 sq. cm
(c) 12 sq. cm (d) 16 sq. cm

141. In an equilateral triangle of side 24 cm, a circle is inscribed touching its sides. The area of the remaining portion of the triangle is
($\sqrt{3}$ =1.732)
(a) 98.55 sq. cm (b) 100 sq. cm
(c) 101 sq. cm (d) 95 sq. cm

142. Two sides of a plot measuring 32 m and 24 m and the angle between them is a perfect right angle. The other two sides measure 25 m each and the other three angles are not right angles. The area of the plot in m^2 is
(a) 768 (b) 534
(c) 696.5 (d) 684

143. a and b are two sides adjacent to the right angle of a right angled triangle and p is the perpendicular drawn to the hypotenuse from the opposite vertex. Then p^2 is equal to
(a) a^2+b^2 (b) $\frac{1}{a^2}+\frac{1}{b^2}$
(c) $\frac{a^2b^2}{a^2+b^2}$ (d) a^2-b^2

144. A is the centre of circle whose radius is 8 and B is the centre of a circle whose diameter is 8. If these two circles touch externally, then the area of the circle with diameter AB is
(a) 36π (b) 64π
(c) 144π (d) 256π

145. If the numerical value of the height and the area of an equilateral triangle be same. then the length of each side of the triangle is
(a) 2 units (b) 4 units
(c) 5 units (d) 8 units

146. If the length of a side of the square is equal to that of the diameter of a circle, then the ratio of the area of the square and that of the circle ($\pi = \frac{22}{7}$)
(a) 14 : 11 (b) 7 : 11
(c) 11 : 14 (d) 11 : 7

147. If the numerical value of the circumference and area of a circle is same, then the area is
(a) 6π sq. units
(b) 4π sq. units
(c) 8π sq. units
(d) 12π sq. units

148. The perimeter of a triangle is 54 m and its sides are in the ratio 5 : 6 : 7. The area of the triangle is
(a) 18 m^2 (b) $54\sqrt{6}$ m^2
(c) $27\sqrt{2}$ m^2 (d) 25 m^2

149. A circular wire of diameter 112 cm is cut and bent in the form of a rectangle whose sides are in the ratio of 9 : 7. The smaller side of the rectangle is
(a) 77 cm (b) 97 cm
(c) 67 cm (d) 84 cm

150. If the perimeter of an equilateral triangle be 18 cm, then the length of each median is
(a) $3\sqrt{2}$ cm (b) $2\sqrt{3}$ cm
(c) $3\sqrt{3}$ cm (d) $2\sqrt{2}$ cm

151. Two equal maximum sized circular plates are cut off from a circular paper sheet of circumference 352 cm. Then the circumference of each circular plate is
(a) 176 cm (b) 150 cm
(c) 165 cm (d) 180 cm

152. The difference between the circumference and diameter of a circle is 150 m. The radius of that circle is (Take $\pi = \frac{22}{7}$)
(a) 25 metre (b) 35 metre
(c) 30 metre (d) 40 metre

153. The perimeters of a circle, a square and an equilateral triangle are same and their areas are C, S and T respectively. Which of the following statement is true?
(a) C = S = T (b) C > S > T
(c) C < S < T (d) S < C < T

154. A horse takes $2\frac{1}{2}$ seconds to complete a round around a circular field. If the speed of the horse was 66 m/sec, then the radius of the field is,
[Given $\pi = \frac{22}{7}$]
(a) 25.62 m (b) 26.52 m
(c) 25.26 m (d) 26.25 m

155. The diameter of the front wheel of an engine is $2x$ cm and that of rear wheel is 2y cm. to cover the same distance, find the number of times the rear wheel will revolve when the front wheel revolves 'n' times,
(a) $\frac{n}{xy}$ times (b) $\frac{yn}{x}$ times
(c) $\frac{nx}{y}$ times (d) $\frac{xy}{n}$ times

156. Let C_1 and C_2 be the inscribed and circumscribed circles of a triangle with sides 3 cm, 4 cm and 5 cm then $\frac{\text{area of } C_1}{\text{area of } C_2}$ is
(a) $\frac{9}{25}$ (b) $\frac{16}{25}$ (c) $\frac{9}{16}$ (d) $\frac{4}{25}$
(SSS CGL 16–08–2015 Morning)

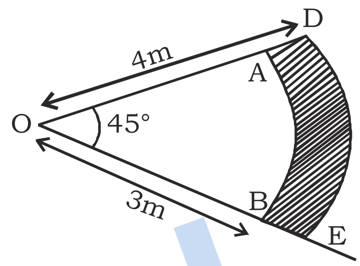
157. A circular swimming pool is surrounded by a concrete wall 4m wide. If the area of the concrete wall surrounding the pool is $\frac{11}{25}$ that of the pool, then the radius(in m) of the pool :
(a) 8 (b) 16 (c) 30 (d) 20
(SSC CGL 16–08–2015 Morning)

158. If the area of a circle is A, radius of the circle is r and circumference of it is c, then
(a) rC = 2A (b) $\frac{C}{A} = \frac{r}{2}$
(c) AC = $\frac{r^2}{4}$ (d) $\frac{A}{r}$ = C
(SSS CGL 09–08–2015 Morning)

159. The sides of a triangle having area 7776 sq. cm are in the ratio 3 : 4 : 5. The perimeter of the triangle is:
(a) 400 cm (b) 412 cm
(c) 424 cm (d) 432 cm
(SSS CGL 09–08–2015 Morning)

160. The perimeter of a sheet of paper in the shape of a quadrant of a circle is 75 cm. Its area would be ($\pi = \frac{22}{7}$)
(a) 512.25 cm^2 (b) 346.5 cm^2
(c) 100 cm^2 (d) 693 cm^2
(CPO 21–06–2015 Morning))

161. In the figure, OED and OBA are sectors of a circle with centre O. The area of the shaded portion.



(a) $\frac{11}{16}$ m^2 (b) $\frac{11}{8}$ m^2
(c) $\frac{11}{2}$ m^2 (d) $\frac{11}{4}$ m^2
(CPO 21–06–2015 Evening)

162. If the circumference of a circle is $\frac{30}{\pi}$, then the diameter of the circle is
(a) 30 (b) $\frac{15}{\pi}$ (c) 60π (d) $\frac{30}{\pi^2}$
(CPO 21–06–2015 Evening)

163. The outer and inner diameter of a circular path be 728 cm and 700 cm respectively. The breadth of the path is
(a) 7 cm (b) 14 cm
(c) 28 cm (d) 20 cm
(CGL Mains 12–04–2015)

164. A piece of wire when bent to form a circle will have a radius of 84 cm. If the wire is bent to form a square, the length of a side of the square is
(a) 152 cm (b) 168 cm
(c) 132 cm (d) 225 cm
(CGL Mains 12–04–2015)

165. The area of a circle is 324 π sq.cm. The length of its longest chord (in cm.) is
(a) 36 (b) 38 (c) 28 (d) 32
(CGL Mains 12–04–2015)

166. The circumference of a triangle is 24 cm and the circumference of its in-circle is 44 cm. Then the area of the triangle is (taking $\pi = \frac{22}{7}$)
(a) 56 square cm
(b) 48 square cm
(c) 84 square cm
(d) 68 square cm

167. The inner-radius of a triangle is 6 cm, and the sum of the lengths of its sides is 50 cm. The area of the triangle (in sq. cm.) is
(a) 150 (b) 300 (c) 50 (d) 56
(CGL Mains 12–04–2015)

168. One of the angles of a right-angled triangle is 15°, and the hypotenuse is 1 m. The area of the triangle (in sq. cm.) is
(a) 1220 (b) 1250
(c) 1200 (d) 1215
(CGL Mains 12–04–2015)

169. What is the position of the circumcentre of an obtuse-angled triangle?
(a) It is the vertex opposite to the largest side.
(b) It is the mid point of the largest side.
(c) It lies outside the triangle
(d) It lies inside the triangle.
(SSC LDC 01–11–2015, Evening)

170. The ratio of circumference and diameter of a circle is 22 : 7. If the circumference be $1\frac{4}{7}$ m, then the radius of the circle is:
(a) $\frac{1}{4}$ m (b) $\frac{1}{3}$ m
(c) $\frac{1}{2}$ m (d) 1 m
(SSC LDC 15–11–2015, Morning)

171. The area of a circle whose radius is the diagonal of a square whose area is 4 is:
(a) 4π (b) 8π (c) 6π (d) 16π
(SSC LDC 15–11–2015, Morning)

TYPE C

172. The diagonals of a rhombus are 32 cm and 24 cm respectively. The perimeter of the rhombus is:
(a) 80 cm (b) 72 cm
(c) 68 cm (d) 64 cm

173. The perimeter of a rhombus is 40 cm, If one of the diagonals be 12 cm long, what is the length of the other diagonal ?
(a) 12 cm (b) $\sqrt{136}$ cm,
(c) 16 cm (d) $\sqrt{44}$ cm

174. The perimeter of a rhombus is 40 m and its height is 5m its area is:
(a) 60 m^2 (b) 50 m^2
(c) 45 m^2 (d) 55 m^2

175. The area of a rhombus is 150 cm^2. The length of one of its diagonals is 10 cm. The length of the other diagonal is :
(a) 25 cm (b) 30 cm
(c) 35 cm (d) 40 cm

176. The area of a regular hexagon of side $2\sqrt{3}$ cm is :
(a) $18\sqrt{3}$ cm^2 (b) $12\sqrt{3}$ cm^2
(c) $36\sqrt{3}$ cm^2 (d) $27\sqrt{3}$ cm^2

177. The length of one side of a rhombus is 6.5 cm and its altitude is 10 cm. If the length of its diagonal be 26 cm, the length of the other diagonal will be:
(a) 5 cm (b) 10 cm
(c) 6.5 cm (d) 26 cm

178. The measure of each of two opposite angles of a rhombus is 60° and the measure of one of its sides is 10 cm. The length of its smaller diagonal is :
(a) 10cm (b) $10\sqrt{3}$ cm
(c) $10\sqrt{2}$ cm (d) $\frac{5}{2}\sqrt{2}$ cm

179. The perimeter of a rhombus is 100 cm, If one of its diagonals is 14 cm.Then the area of the rhombus is
(a) 144 cm^2 (b) 225 cm^2
(c) 336 cm^2 (d) 400 cm^2

180. The ratio of the length of the parallel sides of a trapezium is 3 : 2. The shortest distance between them is 15 cm. If the area of the trapezium is 450 cm^2, the sum of the length of the parallel sides is
(a) 15 cm (b) 36 cm
(c) 42 cm (d) 60 cm

181. A parallelogram has sides 15 cm and 7 cm long. The length of one of the diagonals is 20 cm. The area of the parallelogram is
(a) 42 cm^2 (b) 60 cm^2
(c) 84 cm^2 (d) 96 cm^2

182. The perimeter of a rhombus is 40 cm and the measure of an angle is 60°, then the area of it is:
(a) $100\sqrt{3}$ cm^2 (b) $50\sqrt{3}$ cm^2
(c) $160\sqrt{3}$ cm^2 (d) 100 cm^2

183. Two adjacent sides of a parallelogram are of length 15 cm and 18 cm, If the distance between two smaller sides is 12 cm, then the distance between two bigger sides is
(a) 8 cm (b) 10 cm
(c) 12 cm (d) 15 cm

184. A parallelogram ABCD has sides AB = 24 cm and AD = 16 cm. The distance between the sides AB and DC is 10 cm. Find the distance between the sides AD and BC.
(a) 15 cm (b) 18 cm
(c) 16 cm (d) 9 cm

185. If the diagonals of a rhombus are 8 cm and 6 cm, then the area of square having same side as that of rhombus is
(a) 25 (b) 55 (c) 64 (d) 36

186. The perimeter of a non-square rhombus is 20 cm. One its diagonal is 8 cm. The area of the rhombus is
(a) 28 sq. cm (b) 20 sq. cm
(c) 22 sq. cm (d) 24 sq. cm

187. In ΔABC, D and E are the points of sides AB and BC respectively such that $DE \parallel AC$ and $AD : BD = 3 : 2$. The ratio of area of trapezium ACED to that of ΔBED is
(a) 4 : 15 (b) 15 : 4
(c) 4 : 21 (d) 21 : 4

188. The length of each side of a rhombus is equal to the length of the side of a square whose diagonal is $40\sqrt{2}$ cm. If the length of the diagonals of the rhombus are in the ratio 3 : 4, then its area (in cm^2) is
(a) 1550 (b) 1600
(c) 1535 (d) 1536

189. ABCD is a parallelogram. BC is produced to Q such that BC = CQ. Then
(a) area (ΔABC) = area (ΔDCQ)
(b) area (ΔABC) > area (ΔDCQ)
(c) area (ΔABC) < area (ΔDCQ)
(d) area (ΔABC) $\neq$ area (ΔDCQ)

190. ABCD is parallelogram. P and Q are the mid- points of sides BC and CD respectively. If the area of ΔABC is 12 cm^2, then the area of ΔAPQ is

(a) 12 cm^2 (b) 8 cm^2
(c) 9 cm^2 (d) 10 cm^2

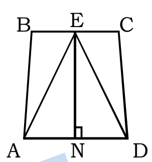
191. One of the four angles of a rhombus is 60°. If the length of each side of the rhombus is 8 cm, then the length of the longer diagonal is

(a) $8\sqrt{3}$ cm (b) 8 cm
(c) $4\sqrt{3}$ cm (d) $\frac{8}{\sqrt{3}}$ cm

192. A parallelogram has sides 60 m and 40 m and one of its diagonals is 80 m long. Its area is

(a) $500\sqrt{15}$ m^2 (b) $600\sqrt{15}$ m^2
(c) $400\sqrt{15}$ m^2 (d) $450\sqrt{15}$ m^2

193. ABCD is a trapezium with AD and BC parallel sides. The ratio of the area of ABCD to that of ΔAED is



(a) $\frac{\overline{AD}}{\overline{BC}}$ (b) $\frac{\overline{BE}}{\overline{EC}}$
(c) $\frac{\overline{AD}+\overline{BE}}{\overline{AD}+\overline{CE}}$ (d) $\frac{\overline{AD}+\overline{BC}}{\overline{AD}}$

194. The perimeter of a rhombus is 2p unit and sum of length of diagonals is m unit, then area of the rhombus is

(a) $\frac{1}{4}m^2p$ sq unit
(b) $\frac{1}{4}mp^2$ sq unit
(c) $\frac{1}{4}\left(m^2-p^2\right)$ sq unit
(d) $\frac{1}{4}\left(p^2-m^2\right)$ sq unit

195. The lengths of two parallel sides of a trapezium are 6 cm and 8 cm. If the height of the trapezium be 4 cm, then its area is

(a) 28 cm^2 (b) 56 cm^2
(c) 30 cm^2 (d) 36 cm^2

196. The area of an isosceles trapezium is 176 cm^2 and the height is 2/11th of the sum of its parallel sides. If the ratio of the length of the parallel sides is 4 : 7, then the length of a diagonal (in cm) is

(a) $2\sqrt{137}$ (b) 24
(c) $\sqrt{137}$ (d) 28

(CGL mains 25–10–2015)

197. The area of a rhombus is 256 sq.cm. and one of its diagonal is twice the other in length. Then length of its larger diagonal is

(a) 32 cm (b) 48 cm
(c) 36 cm (d) 24 cm

(CGL Mains 12–04–2015)

198. The length of two parallel sides of a trapezium are 15 cm and 20 cm. If its area is 175 sq.cm, then its height is:

(a) 25 cm (b) 10 cm
(c) 20 cm (d) 15 cm

(SSC LDC 06–12–2015, Evening)

TYPE D

199. The cost of painting a room is ₹120. If the width had been 4 metres less, the cost of the Carpet would have been ₹20 less. The width of the room is:

(a) 24 m (b) 20 m
(c) 25 m (d) 18.4 m

200. The floor of a corridor is 100 m long and 3 m wide. Cost of covering the floor with carpet 50 cm wide at the ratio of ₹ 15 per m is

(a) ₹4500 (b) ₹9000
(c) ₹7500 (d) ₹1900

201. A playground is in the shape of a rectangle. A sum of ₹1,000 was spent to make the ground usable at the rate of 25 paise per sq. m. The breadth of the ground is 50 m. If the length of the ground is increased by 20 m. what will be the expenditure (in rupees) at the same rate per sq. m.?

(a) 1,250 (b) 1,000
(c) 1,500 (d) 2,250

202. A hall 25 metres long and 15 metres broad is surrounded by a varandah of uniform width of 3.5 metres. The cost of flooring the varandah, at ₹ 27.50 per square metre is

(a) ₹ 9149.50 (b) ₹ 8146.50
(c) ₹ 9047.50 (d) ₹ 4186.50

203. The outer circumference of a circular race-track is 528 metre. The track is everywhere 14 metre wide. Cost of levelling the track at the rate of ₹10 per sq. metre is :

(a) ₹ 77660 (b) ₹ 67760
(c) ₹ 66760 (d) ₹ 76760

(SSC LDC 06–12–2015, Evening)

TYPE E

204. The length and breadth of a rectangular field are in the ratio of 3 : 2. If the perimeter of the field is 80m, its breadth (in metres) is:

(a) 18 (b) 16 (c) 10 (d) 24

205. The sides of a rectangular plot are in the ratio 5 : 4 and its area is equal to 500 sq.m The perimeter of the plot is :

(a) 80 m (b) 100 m
(c) 90 m (d) 95 m

206. ABC is a triangle with base AB, D is a point on AB such that AB = 5 and DB =3. What is the ratio of the area of ΔADC to the area of ΔABC ?

(a) 2/5 (b) 2/3
(c) 9/25 (d) 4/25

207. If the area of a triangle is 1176 cm^2 and the ratio of base and corressponding altitude is 3 : 4, then the altitude of the triangle is:

(a) 42 cm (b) 52 cm
(c) 54 cm (d) 56 cm

208. The sides of a triangle are in the ratio $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$. If the perimeter of the triangle is 52 cm, the length of the smallest side is:

(a) 24 cm (b) 10 cm
(c) 12 cm (d) 9 cm

209. If the diagonals of two squares are in the ratio of 2 : 5. Their area will be in the ratio of

(a) $\sqrt{2}:\sqrt{5}$ (b) 2 : 5
(c) 4 : 25 (d) 4 : 5

210. The ratio of base of two triangles is x : y and that of their areas is a : b. Then the ratio of their corressponding altitudes will be:

(a) $\frac{a}{y}:\frac{b}{x}$ (b) $ax : by$
(c) $ay : bx$ (d) $\frac{x}{a}:\frac{b}{y}$

211. The area of a field in the shape of a trapezium measures 1440m². The perpendicular distance between its parallel sides is 24m. If the ratio of the parallel sides is 5 : 3, the length of the longer parallel side is:
(a) 75 m (b) 45 m
(c) 120 m (d) 60 m

212. If the ratio of areas of two squares is 225 : 256, then the ratio of their perimeter is:
(a) 225 : 256 (b) 256 : 225
(c) 15 : 16 (d) 16 : 15

213. The area of a triangle is 216 cm^2 and its sides are in the ratio 3 : 4 : 5. The perimeter of the triangle is:
(a) 6 cm (b) 12 cm
(c) 36 cm (d) 72 cm

214. A circular wire of radius 42 cm is bent in the form of a rectangle whose sides are in the ratio of 6 : 5. The smaller side of the rectangle is

(Take $\pi = \frac{22}{7}$):
(a) 60 cm (b) 30 cm
(c) 25 cm (d) 36 cm

215. The ratio of the outer and the inner perimeter of a circular path is 23 : 22, If the path is 5 meters wide the diameter of the inner circle is:
(a) 110 m (b) 55 m
(c) 220 m (d) 230 m

216. The angles of a triangle are in the ratio 3 : 4 : 5. The measure of the largest angle of the triangle is
(a) 60° (b) 75°
(c) 120° (d) 150°

217. The ratio of the area of a square to that of the square drawn on its diagonal is:
(a) 1 : 1 (b) 1 : 2
(c) 1 : 3 (d) 1 : 4

218. A square and an equilateral triangle are drawn on the same base. The ratio of their area is
(a) 2 :1 (b) 1 : 1
(c) $\sqrt{30} : \sqrt{4}$ (d) $4 : \sqrt{3}$

219. If the area of a circle and a square are equal, then the ratio of their perimeter is
(a) 1 : 1 (b) 2 : π
(c) π : 2 (d) $\sqrt{\pi}$: 2

220. The area of two equilateral triangles are in the ratio 25 : 36. Their altitudes will be in the ratio:
(a) 36 : 25 (b) 25 : 36
(c) 5 : 6 (d) $\sqrt{5} : \sqrt{6}$

221. If the length and the perimeter of a rectangle are in the ratio 5 : 16. then its length and breadth will be in the ratio
(a) 5 : 11 (b) 5 : 8
(c) 5 : 4 (d) 5 :3

222. Through each vertex of a triangle, a line parallel to the opposite side is drawn. the ratio of the perimeter of the new triangle. thus formed, with that of the original triangle is
(a) 3 : 2 (b) 1 : 2
(c) 2 : 1 (d) 2 : 3

223. The ratio of the number giving the measure of the circumference and the area of a circle of radius 3 cm is
(a) 1 : 3 (b) 2 : 3
(c) 2 : 9 (d) 3 : 2

224. The radius of circle A is twice that of circle B and the radius of circle B is twice that of circle C. Their area will be in the ratio
(a) 16 : 4 : 1 (b) 4 : 2 : 1
(c) 1 : 2 : 4 (d) 1 : 4 : 16

225. The sides of a quadrilateral are in the ratio 3 : 4 : 5 : 6 and its perimeter is 72 cm. The length of its greatest side (in cm) is
(a) 24 (b) 27
(c) 30 (d) 36

226. The ratio of the radii of two wheels is 3: 4. The ratio of their circumference is
(a) 4 : 3 (b) 3 : 4
(c) 2 : 2 (d) 3 : 2

227. If in a $\triangle ABC$, the medians CD and BE intersect each other at O, then the ratio of the areas of $\triangle ODE$ and ΔOBC is
(a) 1 : 4 (b) 6 : 1
(c) 1 : 12 (d) 12 : 1

228. The ratio of the area of two isosceles triangles having the same vertical angle (i.e. angle between equal sides) is 1 : 4. The ratio of their heights is
(a) 1 : 4 (b) 2 : 5
(c) 1 : 2 (d) 3 : 4

229. The ratio of length of each equal side and the third side of an isosceles triangle is 3 : 4. If the area is $8\sqrt{5}$ units². the small side is
(a) 3 units
(b) $2\sqrt{5}$ square units units
(c) $8\sqrt{2}$ units
(d) 12 units

230. The ratio of sides of a triangle is 3 : 4 : 5. If area of the triangle is 72 square unit then the length of the smallest side is :
(a) $4\sqrt{3}$ unit (b) $5\sqrt{3}$ unit
(c) $6\sqrt{3}$ unit (d) $3\sqrt{3}$ unit

231. The ratio of sides of a triangle is 3 : 4 : 5 and area of the triangle is 72 squares unit. Then the area of an equilateral triangle whose perimeter is same as that of the previous triangle is
(a) $32\sqrt{3}$ square units
(b) $48\sqrt{3}$ square units
(c) 96 square units
(d) $60\sqrt{3}$ square units

232. An equilateral triangle is drawn on the diagonal of a square. The ratio of the area of the triangle to that of the square is
(a) $\sqrt{3} : 2$ (b) $1 : \sqrt{3}$
(c) $2 : \sqrt{3}$ (d) $4 : \sqrt{3}$

233. Two triangles ABC and DEF are similar to each other in which AB = 10 cm, DE = 8 cm. Then the ratio of the area of triangles ABC and DEF is
(a) 4 : 5 (b) 25 : 16
(c) 64 : 125 (d) 4 : 7

234. The ratio between the area of two circles is 4 : 7. What will be the ratio of their radii ?
(a) $2 : \sqrt{7}$ (b) 4 : 7
(c) 16 : 49 (d) 4 : $\sqrt{7}$

235. The area of a circle is proportional to the square of its radius. A small circle of radius 3 cm is drawn within a larger circle of radius 5 cm. Find the ratio of the area of the annular zone to the area of the larger circle (Area of the annular zone is the difference between the area of the larger circle and that of the smaller circle)
(a) 9 : 16 (b) 9 : 25
(c) 16 : 25 (d) 16 : 27

236. The diameter of two circles are the side of a square and the diagonal of the square. The ratio of the area of the smaller circle and the larger circle is
(a) 1 : 2 (b) 1 : 4
(c) $\sqrt{2}:\sqrt{3}$ (d) $1:\sqrt{2}$

237. The ratio of the area of an equilateral triangle and that of its circumcircle is
(a) $2\sqrt{3}:2\pi$ (b) $4:\pi$
(c) $3\sqrt{3}:4\pi$ (d) $7\sqrt{2}:2\pi$

238. If the perimeters of a rectangle and a square are equal and the ratio of two adjacent sides of the rectangle is 1 : 2 then the ratio of area of the rectangle and that of the square is
(a) 1 : 1 (b) 1 : 2
(c) 2 : 3 (d) 8 : 9

239. The perimeter of a rectangle and an equilateral triangle are same. Also. one of the sides of the rectangle is equal to the side of the triangle. The ratio of the area of the rectangle and the triangle is
(a) $\sqrt{3}:1$ (b) $1:\sqrt{3}$
(c) $2:\sqrt{3}$ (d) $4:\sqrt{3}$

240. ABC is an isosceles right angled triangle with $\angle B$ = 90°, On the sides AC and AB, two equilateral triangles ACD and ABE have been constructed. The ratio of area of $\triangle ABE$ and $\triangle ACD$ is
(a) 1 : 3 (b) 2 : 3
(c) 1 : 2 (d) $1:\sqrt{2}$

241. If the arcs of unit length in two circles subtend angles of 60° and 75° at their centres, the ratio of their radii is
(a) 3 : 4 (b) 4 : 5
(c) 5 : 4 (d) 3 : 5

242. ABCD is a parallelogram in which diagonals AC and BD intersect at O. If E, F, G and H are the mid- points of AO, DO, CO and BO respectively, then the ratio of the perimeter of the quadrilateral EFGH to the perimeter of parallelogram ABCD is
(a) 1 : 4 (b) 2 : 3
(c) 1 : 2 (d) 1 : 3

TYPE F

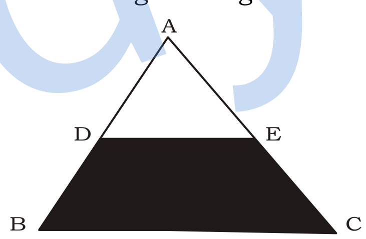
243. If the circumference of a circle increases from 4π to 8π, what change occurs in its area?
(a) It doubles (b) It triples
(c) It quadruples (d) It is halved

244. If the length of a rectangle is increased by 25% and the width is decreased by 20%, then the area of the rectangle:
(a) Increases by 5%
(b) decreases by 5%
(c) remains unchanged
(d) incrases by 10%

245. The area of a circle of radius 5 is numerically what percent of its circumferernce?
(a) 200% (b) 255%
(c) 240% (d) 250%

246. If the circumference and area of a circle are numerically equal, then the diameter is equal to:
(a) 2 (b) $\frac{\pi}{2}$
(c) 2π (d) 4

247. If D and E are the mid-points of the side AB and AC respectively of the $\triangle ABC$ in the figure given here, the shaded region of the triangle is what per cent of the whole triangular region ?



(a) 50% (b) 25%
(c) 75% (d) 60%

248. If the circumference of a circle is reduced by 50%, its area will be reduced by
(a) 12.5% (b) 25%
(c) 50% (d) 75%

249. If the side of a square is increased by 25%, then its area is increased by:
(a) 25% (b) 55%
(c) 40.5% (d) 56.25%

250. If the radius of a circle is increased by 50%. its area is increased by:
(a) 125% (b) 100%
(c) 75% (d) 50%

251. If the altitude of a triangle is increased by 10% while its area remains same, its corresponding base will have to be decreased by
(a) 10% (b) 9%
(c) $9\frac{1}{11}$% (d) $11\frac{1}{9}$%

252. If the sides of an equilateral triangle are increased by 20%,30% and 50% respectively to form a new triangle the increase in the perimeter of the equilateral triangle is
(a) 25% (b) $33\frac{1}{3}$%
(c) 75% (d) 100%

253. Each side of a rectangular field is diminished by 40%. By how much percent is the area of the field diminished ?
(a) 32% (b) 64%
(c) 25% (d) 16%

254. the length of rectangle is increased by 60%. By what percent would the breadth to be decreased to maintain the same area?
(a) $37\frac{1}{2}$% (b) 60%
(c) 75% (d) 120%

255. The length of a room floor exceceds its breadth by 20m . The area of the floor remains unaltered when the length is decreased by 10 m but the breadth is increased by 5 m. The area of the floor (in square meters) is:
(a) 280 (b) 325
(c) 300 (d) 420

256. In measuring the sides of a rectangle, there is an excess of 5% on one side and 2% deficit on the other. Then the error percent in the area is
(a) 3.3% (b) 3.0 %
(c) 2.9% (d) 2.7%

257. The length and breadth of a rectangle are increased by 30% and 20% respectively. The area of the rectangle so formed exceeds the area of the rectangle by
(a) 46% (b) 66%
(c) 42% (d) 56%

258. If side of a square is increased by 40%, the percentage increase in its surface area is
(a) 40% (b) 60%
(c) 80% (d) 96%

259. If the diameter of a circle is increased by 8%, then its area is increased by:
(a) 16.64% (b) 6.64%
(c) 165 (d) 16.46%

260. The length and breadth of a rectangle are doubled. Percentage increase in area is
(a) 150% (b) 200%
(c) 300% (d) 400%

TYPE G

261. If diagonal of a cube is $\sqrt{12}$ cm, then its volume in cm^3 is :
(a) 8 (b) 12
(c) 24 (d) $\sqrt[3]{2}$

262. How many cubes, each of edge 3 cm, can be cut from a cube of edge 15 cm?
(a) 25 (b) 027
(c) 125 (d) 144

263. A cuboidal water tank has 216 litres of water. Its depth is $\frac{1}{3}$ of its length and breadth is $\frac{1}{2}$ of $\frac{1}{3}$ of the difference of length and breadth. The length of the tank is
(a) 72 dm (b) 18 dm
(d) 6 dm (d) 2 dm

264. The volume of cuboid is twice the volume of a cube. If the dimensions of the cuboid are 9 cm, 8 cm and 6 cm, the total surface area of the cube is:
(a) 72 cm^2 (b) 216 cm^2
(c) 432 cm^2 (d) 108 cm^2

265. The length, breadth and height of a room is 5m , 4 m and 3m respectively. Find the length of the largest bamboo that can be kept inside the room.
(a) 5 m (b) 60 m
(c) 7 m (d) $5\sqrt{2}$ m

266. A wooden box measures 20 cm by 12 cm by 10 cm . Thickness of wood is 1 cm. Volume of wood to make the box (in cubic cm) is
(a) 960 (b) 519
(c) 2400 (d) 1120

267. A cuboidal block of 6 cm × 9 cm × 12 cm is cut up into exact number of equal cube. The least possible number of cubes will be
(a) 6 (b) 9
(c) 24 (d) 30

268. A cistern of capacity 8000 litres measures externally 3.3 m by 2.6 m by 1.1 m and its walls are 5 cm thick. The thickness of the bottom is :
(a) 1 m (b) 10 cm
(c) 1 dm (d) 90 cm

269. The area of three adjacent faces of a cuboid are x, y, z square units respectively. If the volume of the cuboid by v cube units. then the correct relation between v,x, y, z is
(a) $v^2 = xyz$ (b) $v^3 = xyz$
(c) $v^2 = x^3y^3z^3$ (d) $v^3 = x^2y^2z^2$

270. The largest sphere is carved out of a cube of side 7 cm. The volume of the sphere (in cm^3) will be
(a) 718.66 (b) 543.72
(c) 481.34 (d) 179.67

271. A rectangular sheet of metal is 40 cm by 15 cm . equal squares of side 4cm are cut off at the corners and the remaining is folded up to form an open rectangular box The volume of the box is
(a) 896 cm^3 (b) 986 cm^3
(c) 600 cm^3 (d) 916 cm^3

272. The areas of three consecutive faces of a cuboid are 12 cm^2, then the volume (in cm^3) of the cuboid is
(a) 3600 (b) 100
(c) 80 (d) $24\sqrt{3}$

273. The floor of a room is of size 4 m × 3 m and its height is 3 m. The walls and ceiling of the room require painting. The area to be painted is
(a) 66 m^2 (b) 54 m^2
(c) 42 m^2 (d) 33 m^2

274. If the sum of three dimensions and the total surface area of a rectangular box are 12 cm and 94 cm^2 respectively, then the maximum length of a stick that can be placed inside the box is
(a) $5\sqrt{2}$ cm (b) 5 cm
(c) 6 cm (d) $2\sqrt{5}$ cm

275. The area of the four walls of a room is 660 m^2 and its length is twice its breadth. If the height of the room is 11 m, then area of its floor (in m^2) is
(a) 120 (b) 150
(c) 200 (d) 330

276. If the length of the diagonal of a cube is $8\sqrt{3}$ cm, then its surface area is
(a) 192 cm^2 (b) 512 cm^2
(c) 768 cm^2 (d) 384 cm^2

277. Two cubes of sides 6 cm each are kept side to form a rectangular parallelopiped. The area (in sq. cm) of the whole surface of the rectangular parallelopiped is
(a) 432 (b) 360
(c) 396 (d) 340

278. 2 cm of rain has fallen on a square km of land. Assuming that 50% of the raindrops could have been collected and contained in a pool having a 100 m×10 m base, by what level would the water level in the pool have increased?
(a) 1 km (b) 10 m
(c) 10 cm (d) 1 m

279. A parallelopiped whose sides are in ratio 2 : 4 :8 have the same volume as a cube. The ratio of their surface area is:
(a) 7 : 5 (b) 4 : 3
(c) 8 : 5 (d) 7 :6

280. If two adjacent sides of a rectangular parallelopiped are 1 cm and 2 cm and the total surface area of the parallelopiped is 22 square cm, then the diagonal of the parallelopiped is
(a) $\sqrt{10}$ cm (b) $2\sqrt{3}$ cm
(c) $\sqrt{14}$ cm (d) 4 cm

281. If the sum of the length, Breadth and height of a rectangular parallelopiped is 24 cm and the length of its diagonal is 15 cm, then its total surface area is
(a) 256 cm^2 (b) 265 cm^2
(c) 315 cm^2 (d) 351 cm^2

282. If the total surface area of a cube is 96 cm^2, its volume is
(a) 56 cm^3 (b) 16 cm^3
(c) 64 cm^3 (d) 36 cm^3

283. The length of the largest possible rod that can be placed in a cubical room is $35\sqrt{3}$ m. The surface area of the largest possible sphere that fit within the cubical room (assuming $\pi = \frac{22}{7}$)(in sq. m) is
(a) 3,500 (b) 3,850
(c) 2,450 (d) 4,250

284. The volume of air in a room is 204 m^3. The height of the room is 6 m. What is the floor area of the room?
(a) 32 m^2 (b) 46 m^2
(c) 44 m^2 (d) 34 m^2

285. Three solid iron cubes of edges 4 cm, 5 cm and 6 cm are melted together to make a new cube. 62 cm^3 of the melted material is lost due to improper handling. The area (in cm^2) of the whole surface of the newly formed cube is
(a) 294 (b) 343
(c) 125 (d) 216

286. Some bricks are arranged in an area measuring 20 m^3 If the length, breadth and height of each brick is 25 cm, 12.5 cm and 8 cm respectively, then the number of bricks are (suppose there is no gap in between two bricks)
(a) 6,000 (b) 8,000
(c) 4,000 (d) 10,000

287. The ratio of the length and breadth of a rectangular parallelopiped is 5 : 3 and its height is 6 cm. If the total surface area of the parallelopiped be 558 sq. cm, then its length in dm is
(a) 9 (b) 1.5
(c) 10 (d) 15

288. The length, breadth and height of a cuboid are in the ratio 3 : 4 : 6 and its volume is 576 cm^3. The whole surface area of the cuboid is
(a) 216 cm^2 (b) 324 cm^2
(c) 432 cm^2 (d) 460 cm^2

289. If the number of vertices, edges and faces of a rectangular parallelopiped are denoted by v, e and f respectively, the value of (v – e + f) is
(a) 4 (b) 1
(c) 0 (d) 2

(SSC CGL 16–08–2015 Morning)

290. A low land, 48 m long and 31.5m broad is raised to 6.5 dm. For this, earth is removed from a cuboidal hole, 27 m long and 18.2 m broad, dug by the side of the land. The depth of the hole will be.
(a) 3 m (b) 2 m
(c) 2.2 m (d) 2.5 m

(SSC LDC 01–11–2015, Morning)

291. A cuboidal shaped water tank, 2.1 m long and 1.5 m broad is half filled with water. If 630 litres more water is poured into tank, the water level will rise
(a) 2 cm (b) 0.15 cm
(c) 0.20 metre (d) 0.18 cm

(SSC LDC 20–12–2015, Morning)

292. A solid cuboid of dimensions 8 cm × 4 cm × 2 cm is melted and cast into identical cubes of edge 2 cm. Number of such identical cubes is.
(a) 16 (b) 4
(c) 10 (d) 8

(SSC LDC 20–12–2015, Evening)

TYPE H

293. A metallic hemisphere is melted and recast in the shape of cone with the same base radius (R) as that of the hemisphere. If H is the height of the cone, then:
(a) H = 2 R (b) H = $\frac{2}{3}$ R
(c) H = $\sqrt{3R}$ (d) B = 3R

294. If the radius of a sphere is increased by 2 cm, its surface area increased by 352 cm^2. The radius of sphere before change is:
(a) 3 cm (b) 4 cm
(c) 5 cm (d) 6 cm

295. The height of a conical tank is 60 cm and the diameter of its base is 64cm. The cost of painting it from outside at the rate of ₹ 35 per sq. m. is :
(a) ₹ 52.00 approx,
(b) ₹ 39.20 approx,
(c) ₹ 35.20 approx,
(d) ₹ 23.94 approx,

296. A solid metallic cone of height 10 cm, radius of base 20 cm is melted to make spherical balls each of 4 cm diameter. How many such balls can be made?
(a) 25 (b) 75
(c) 50 (d) 125

297. A cylindrical tank of diameter 35 cm is full of water. If 11 litres of water is drawn off, the water level in the tank will drop by :
(a) $10\frac{1}{2}$ cm (b) $12\frac{6}{7}$ cm
(c) 14 cm (d) $11\frac{3}{7}$ cm

298. The circumference of the base of a circular cylinder is 6π cm. The height of the cylinder is equal to the diameter of the base. How many litres of water can it hold?
(a) 54π cm^3 (b) 36π cm^3
(c) 0.054π cm^3 (d) 0.54π cm^3

299. The volume of a right circular cylinder is equal to the volume of that right circular cone whose height is 108 cm and diameter of base is 30 cm. If the height of the cylinder is 9 cm, the diameter of its base is
(a) 30 cm (b) 60 cm
(c) 50 cm (d) 40 cm

300. Three solid metallic spheres of diameter 6 cm, 8 cm and 10 cm are melted and recast into a new soild sphere. The diameter of the new sphere is:
(a) 4 cm (b) 6 cm
(c) 8 cm (d) 12 cm

301. The slant height of a conical mountain is 2.5 km and the area of its base is 1.54 km^2. Taking $\pi = \frac{22}{7}$, the height of the mountain is
(a) 2.2 km (b) 2.4 km
(c) 3 km (d) 3.11 km

302. The base of a conical tent is 19.2 metres in diameter and the height is 2.8 metres . The area of the canvas required to put up such a tent (in square meters) (taking $\pi = \frac{22}{7}$) is nearly.
(a) 3017.1 (b) 3170
(c) 301.7 (d) 30.17

303. A hollow cylinderical tube 20 cm long is made of iron and its external and internal diameters are 8 cm and 6 cm respectively. The volume of iron used in making the tube is ($\pi = \frac{22}{7}$)
(a) 1760 cm^2 (b) 880 cm^3
(c) 440 cm^3 (d) 220 cm^3

304. A sphere of radius 2 cm is put into water contained in a cylinder of base- radius 4 cm. If the sphere is completely immersed in the water, the water level in the cylinder rise by

(a) $\frac{1}{3}$ cm (b) $\frac{1}{2}$ cm

(c) $\frac{2}{3}$ cm (d) 2cm

305. A solid metallic spherical ball of diameter 6 cm is melted and recasted into a cone with diameter of the base as 12 cm. The height of the cone is

(a) 6 cm (b) 2 cm

(c) 4 cm (d) 3 cm

306. The volume of a right circular cone is 1232 cm^3 and its vertical height is 24 cm . Its curved surface area is

(a) 154 cm^2 (b) 550 cm^2

(c) 604 cm^2 (d) 704 cm^2

307. The volume of a sphere is $\frac{88}{21}\times(14)^3$ cm^3 The curved surface area of the sphere is (Take $\pi=\frac{22}{7}$)

(a) 2424 cm^2 (b) 2446 cm^2

(c) 2484 cm^2 (d) 2464 cm^2

308. The diameter of the base of a cylindrical drum is 35 dm. and the height is 24 dm. It is full of kerosene. How many tins each of size 25 cm × 22 cm × 35 cm can be filled with kerosene from the drum? (use $\pi=\frac{22}{7}$)

(a) 1200 (b) 1020

(c) 600 (d) 120

309. A hollow iron pipe is 21 cm long and its exterior diameter is 8 cm. If the thickness of the pipe is 1 cm and iron weights 8 g/cm^3, then the weight of the pipe is (Take $\pi=\frac{22}{7}$):

(a) 3.696 kg (b) 3.6 kg

(c) 36 kg (d) 36.9 kg

310. The volume of a right circular cylinder, 14 cm in height, is equal to that of a cube whose edge is 11 cm. Find the radius of the base of the cylinder is (Take $\pi=\frac{22}{7}$)

(a) 5.2 cm (b) 5.5 cm

(c) 11.0 cm (d) 22.0 cm

311. Each of the measure of the radius of base of a cone and that of a sphere is 8 cm. Also, the volume of these two solids are equal. the slant height of the cone is

(a) $8\sqrt{17}$ cm (b) $4\sqrt{17}$ cm

(c) $34\sqrt{2}$ cm (d) 34 cm

312. A well 20 m in diameter is dug 14 m deep and the earth taken out is spread all around it to a width of 5 m to form an embankment. The height of the embankment is:

(a) 10 m (b) 11 m

(c) 11.2 m (d) 11.5 m

313. The diameter of the iron ball used for the shot-put game is 14 cm. It is melted and then a solid cylinder of height $2\frac{1}{3}$ cm is made. What will be the diameter of the base of the cylinder?

(a) 14 cm (b) 28 cm

(c) $\frac{14}{3}$ cm (d) $\frac{28}{3}$ cm

314. The sum of radii of two spheres is 10 cm and the sum of their volume is 880 cm^3. What will be the product of their radii?

(a) 21 (b) $26\frac{1}{3}$

(c) $33\frac{1}{3}$ (d) 70

315. A rectangular paper sheet of dimensions 22 cm × 12 cm is folded in the form of a cylinder along its length. What will be the volume of this cylinder? (Take $\pi=\frac{22}{7}$)

(a) 460 cm^3 (b) 462 cm^3

(c) 624 cm^3 (d) 400 cm^3

316. A copper rod of 1 cm diameter and 8 cm length is drawn into a wire of uniform diameter and 18 m length. The radius (in cm) of the wire is

(a) $\frac{1}{15}$ (b) $\frac{1}{30}$

(c) $\frac{2}{15}$ (d) 15

317. 12 spheres of the same size are made by melting a solid cylinder of 16 cm diameter and 2 cm height. The diameter of each sphere is :

(a) 2 cm (b) 4 cm

(c) 3 cm (d) $\sqrt{3}$ cm

318. When the circumference of a toy balloon is increased from 20 cm to 25 cm its radius (in cm) is increased by:

(a) 5 (b) $\frac{5}{\pi}$

(c) $\frac{5}{2\pi}$ (d) $\frac{\pi}{5}$

319. In a right circular cone, the radius of its base is 7 cm and its height 24 cm. A cross- section is made through the midpoint of the height parallel to the base. The volume of the upper portion is

(a) 169 cm^3 (b) 154 cm^3

(c) 1078 cm^3 (d) 800 cm^3

320. Some solid metallic right circular cones. each with radius of the base 3 cm and height 4 cm, are melted to form a solid sphere of radius 6 cm. The number of right circular cones is

(a) 12 (b) 24

(c) 48 (d) 6

321. A right circular cylinder of height 16 cm is covered by a rectangular tin foil of size 16 cm × 22 cm, The volume of the cylinder is

(a) 352 cm^3 (b) 308 cm^3

(c) 616 cm^3 (d) 176 cm^3

322. If the area of the base of a cone is 770 cm^2 and the area of its curved surface is 814 cm^2. then find its volume.

(a) $213\sqrt{5}$ cm^3 (b) $392\sqrt{5}$ cm^3

(c) $550\sqrt{5}$ cm^3 (d) $616\sqrt{5}$ cm^3

323. The size of a rectangular piece of paper is 100 cm × 44 cm. A cylinder is formed by rolling the paper along its breadth. The volume of the cylinder is (Use $\pi=\frac{22}{7}$)

(a) 4400 cm^3 (b) 15400 cm^3

(c) 35000 cm^3 (d) 144 cm^3

324. The radius of the base and height of a metallic solid cylinder are r cm and 6 cm respectively. It is melted and recast into a solid cone of the same radius of base. The height of the cone is:
(a) 54 cm (b) 27 cm
(c) 18 cm (d) 9 cm

325. The total surface area of a metallic hemisphere is 1848 cm^2. The hemisphere is melted to form a solid right circular cone. If the radius of the base of the cone is the same as the radius of the hemisphere its height is
(a) 42 cm (b) 26 cm
(c) 28 cm (d) 30 cm

326. What part of a ditch, 48 metres long, 16.5 metres broad and 4 metres deep can be filled by the earth got by digging a cylinderical tunnel of diameter 4 metres and length 56 metres? (Use $\pi = \frac{22}{7}$)
(a) $\frac{1}{9}$ (b) $\frac{2}{9}$
(c) $\frac{7}{9}$ (d) $\frac{8}{9}$

327. The volume of the metal of cylindrical pipe is 748 cm^3. The length of the pipe is 14 cm and its external radius is 9 cm. its thickness is
(Take $\pi = \frac{22}{7}$)
(a) 1 cm (b) 5.2 cm
(c) 2.3 cm (d) 3.7 cm

328. Two iron sphere each of diameter 6 cm are immersed in the water contained in a cylinerical vessel of radius 6 cm. The level of the water in the vessel will be raised by
(a) 1 cm (b) 2 cm
(c) 3 cm (d) 6 cm

329. The height of the cone is 30 cm. A small cone is cut off at the top by a plane parallel to its base. If its volume is $\frac{1}{27}$ of the volume of the cone. At what height above the base, is the section made?
(a) 6 cm (b) 8 cm
(c) 10 cm (d) 20 cm

330. A solid metallic sphere of radius 3 decimetres is melted to form a circular sheet of 1 milimetre thickness. The diameter of the sheet so formed is
(a) 26 metres (b) 24 metres
(c) 12 metres (d) 6 metres

331. Water flows through a cylinderical pipe. whose radius is 7 cm, at 5 metre per second. The time, it takes to fill an empty water tank with height 1.54 metres and area of the base (3 × 5) square metres, is
(take $\pi = \frac{22}{7}$)
(a) 6 minutes (b) 5 minutes
(c) 10 minutes (d) 9 minutes

332. If S denotes the area of the curved surface of a right circular cone of height h and semivertical angle α then S equals
(a) $\pi h^2 \tan^2\alpha$
(b) $\frac{1}{3}\pi h^2 \tan^2\alpha$
(c) $\pi h^2 \sec\alpha \tan\alpha$
(d) $\frac{1}{3}\pi h^2 \sec\alpha \tan\alpha$

333. The height and the radius of the base of a right circular cone are 12 cm and 6 cm respectively. The radius of the circular cross-section of the cone cut by a plane parallel to its base at a distance of 3 cm from the base is
(a) 4 cm (b) 5.5 cm
(c) 4.5 cm (d) 3.5 cm

334. If S_1 and S_2 be the surface areas of a sphere and the curved surface area of the circumscribed cylinder respectively, then S_1 is equal to
(a) $\frac{3}{4}S_2$ (b) $\frac{1}{2}S_2$
(c) $\frac{2}{3}S_2$ (d) S_2

335. The volume of a right circular cylinder and that of a sphere are equal and their radii are also equal. If the height of the cylinder be h and the diameter of the sphere d. then which of the following relation is correct?
(a) h =d (b) 2h =d
(c) 2h = 3d (d) 3h =2d

336. Water is being pumped out through a circular pipe whose internal diameter is 7cm. If the flow of water is 12cm per second, how many litres of water is being pumped out in one hour?
(a) 1663.2 (b) 1500
(c) 1747.6 (d) 2000

337. The lateral surface area of a cylinder is 1056 cm^2 and its height is 16cm. Find its volume?
(a) 4545 cm^3 (b) 4455 cm^3
(c) 5445 cm^3 (d) 5544 cm^3

338. The radius of the base and height of a right circular cone are in the ratio 5 : 12. If the volume of the cone is $314\frac{2}{7}$ cm^3, the slant height (in cm) of the cone will be
(a) 12 (b) 13
(c) 15 (d) 17

339. A copper wire of length 36m and diameter 2mm is melted to form a sphere. The radius of the sphere (in cm) is
(a) 2.5 (b) 3
(c) 3.5 (d) 4

340. The diameter of the base of a right circular cone is 4 cm and its height $2\sqrt{3}$ cm. The slant height of the cone is
(a) 5 cm (b) 4 cm
(c) $2\sqrt{3}$ (d) 3 cm

341. The rain water from a roof 22 m × 20 m drains into a cylinderical vessel having a diameter of 2 m and height 3.5 m, If the vessel is just full, then the rainfall (in cm) is :
(a) 2 (b) 2.5
(c) 3 (d) 4.5

342. From a solid cylinder of height 10 cm and radius of the base 6 cm, a cone of same height and same base is removed. The volume of the remaining solid is :
(a) 240π cu. cm
(b) 5280 cu. cm
(c) 620 π cu. cm
(d) 360π cu. cm

343. Two solid right cones of equal height and of radii r_1 and r_2 are melted and made to form a solid sphere of radius R. Then the height of the cone is
(a) $\frac{4R^2}{r_1^2 r_2^2}$ (b) $\frac{4R}{r_1 r_2}$
(c) $\frac{4R^3}{r_1^2 + r_2^2}$ (d) $\frac{R^2}{r_1^2 r_2^2}$

344. The ratio of height and the diameter of a right circular cone is 3 : 2 and its volume is 1078 cc, then (taking $\pi = \frac{22}{7}$) its height is:
(a) 7 cm (b) 14 cm
(c) 21 cm (d) 28 cm

345. A child reshapes a cone made up of clay of height 24 cm and radius 6 cm into a sphere. The radius (in cm) of the sphere is
(a) 6 (b) 12
(c) 24 (d) 48

346. A solid cylinder has total surface area of 462 sq. cm. Its curved surface area is one third of the total surface area. Then the radius of the cylinder is
(a) 7 cm (b) 3.5 cm
(c) 9 cm (d) 11 cm

347. The diameter of a cylinder is 7 cm and its height is 16 cm. Using the value of $\pi = \frac{22}{7}$, the lateral surface area of the cylinder is
(a) 352 cm^2 (b) 350 cm^2
(c) 355 cm^2 (d) 348 cm^2

348. The height of a solid right circular cylinder is 6 metres and three times the sum of the area of its two end faces is twice the area of its curved surface, The radius of its base (in metre) is
(a) 4 (b) 2
(c) 8 (d) 10

349 $\frac{\text{area of isosceles}\Delta}{\text{area of equilateral}\Delta}$. A semi-circular sheet of metal of diameter 28 cm is bent into an open conical cup. The depth of the cup is approximately
(a) 11 cm (b) 12 cm
(c) 13 cm (d) 14 cm

350. A right angled sector of radius r cm is rolled up into a cone in such a way that the two binding radii are joined together . then the curved surface area of the cone is
(a) πr^2 cm^2 (b) $\frac{\pi r^2}{4}$ cm^2
(c) $\frac{\pi r^2}{2}$ cm^2 (d) $2\pi r^2$ cm^2

351. The radius of the base of a conical tent is 16 metres. If $427\frac{3}{7}$ sq. metre canvas is required to construct the tent, then the slant height of the tent is: (take $\pi = \frac{22}{7}$)
(a) 17 metre (b) 15 metre
(c) 19 metre (d) 8.5 metre

352. A circus tent is cylinderical up to a height of 3 m and conical above it. If its diameter is 105m and the slant height of the conical part is 63 m, then the total area of the canvas required to make the tent is (take $\pi = \frac{22}{7}$)
(a) 11385 m^2 (b) 10395 m^2
(c) 9900 m^2 (d) 990 m^2

353. A toy is in the form of a cone mounted on a hemisphere. The radius of the hemisphere and that of the cone is 3 cm and height of the cone is 4 cm. The total surface area of the toy (taking $\pi = \frac{22}{7}$) is
(a) 75.43 sq. cm,
(b) 103.71 sq. cm,
(c) 85.35 sq. cm,
(d) 120.71 sq. cm,

354. Balls of marbles of diameter 1.4 cm are dropped into a cylinderical beaker containing some water and fully submerged. The diameter of the beaker is 7 cm. Find how many marbles have been dropped in it if the water rises by 5.6 cm?
(a) 50 (b) 150
(c) 250 (d) 350

355. A cylindrical rod of iron whose height is eight times its radius is melted and cast into spherical balls each of half the radius of the cylinder. The number of such spherical balls is
(a) 12 (b) 16
(c) 24 (d) 48

356. A cylinder has 'r' as the radius of the base and 'h' as the height. Find the radius of base of another cylinder, having double the volume but the same height as that of the first cylinder:
(a) $\frac{r}{\sqrt{2}}$ (b) $2r$
(c) $r\sqrt{2}$ (d) $\sqrt{2r}$

357. The radius of a cylinder is 10 cm and height is 4 cm. The number of centimetres that may be added either to the radius or to the height to get the same increase in the volume of the cylinder is
(a) 5 cm (b) 4 cm
(c) 25 cm (d) 16 cm

358. The radius of the base of a right circular cone is doubled keeping its height fixed. The volume of the cone will be :
(a) Three times of the previous volume
(b) four times of the previous volume
(c) $\sqrt{2}$ times of the previous volume
(d) double of the previous volume

359. The base of a right circular cone has the same radius a as that of a sphere. Both the sphere and the cone have the same volume. Height of the cone is
(a) $3a$ (b) $4a$
(c) $\frac{7}{4}a$ (d) $\frac{7}{3}a$

360. The circumference of the base of a 16 cm high solid cone is 33 cm What is the volume of the cone in cm^3?
(a) 1028 (b) 616
(c) 462 (d) 828

361. In a cylinderical vessel of diameter 24 cm filled up with sufficient quantity of water, a solid spherical ball of radius 6 cm is completely immersed. Then the increase in height of water level is:
(a) 1.5 cm (b) 2 cm
(c) 3 cm (d) 4.2 cm

362. A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm. Find the the volume of wooden toy (nearly)?
(a) 104 cm^3 (b) 162 cm^3
(c) 421 cm^3 (d) 266 cm^3

363. If a solid cone of volume 27π cm^3

is kept inside a hollow cylinder whose radius and height are equal to that of the cone, then the volume of water needed to fill the empty space is

(a) 3π cm^3 (b) 18π cm^3

(c) 54π cm^3 (d) 81π cm^3

364. A cylindrical vessel whose base is horizontal and is of internal radius 3.5 cm contains sufficient water so that when a solid sphere is placed inside, water just covers the sphere. The sphere fits in the cone exactly. The depth of water in the vessel before the sphere was put, is

(a) $\frac{35}{3}$ cm (b) $\frac{17}{3}$ cm

(c) $\frac{7}{3}$ cm (d) $\frac{14}{3}$ cm

365. The radius and height of a cylinder are in the ratio 5 : 7 and its volume is 550 cm^3. Calculate its curved surface area in sq. cm?

(a) 110 (b) 444

(c) 220 (d) 616

366. The volume of a solid hemisphere is 19404 cm^3. Its total surface area is

(a) 4158 cm^2 (b) 2858 cm^2

(c) 1738 cm^2 (d) 2038 cm^2

367. The base of a cone and a cylinder have the same radius 6 cm. They have also the same height 8 cm. The ratio of the curved surface of the cylinder to that of the cone is

(a) 8 : 5 (b) 8 : 3

(c) 4 : 3 (d) 5 : 3

368. A spherical lead ball of radius 10 cm is melted and small lead balls of radius 5mm are made The total number of possible small lead balls is

(Take $\pi = \frac{22}{7}$)

(a) 8000 (b) 400

(c) 800 (d) 125

369. The number of spherical bullets that can be made out of solid cube of lead whose edge measures 44 cm each bullet being of 4 cm diameter, is (Take $\pi = \frac{22}{7}$)

(a) 2541 (b) 2451

(c) 2514 (d) 2415

370. The radius of a metallic cylinder is 3 cm and its height is 5 cm. It is melted and moulded into small cones, each of height 1 cm and base radius 1 mm. The number of such cones formed is

(a) 450 (b) 1350

(c) 8500 (d) 13500

371. A sector is formed by opening out a cone of base radius 8 cm and height 6 cm. Then the radius of the sector is (in cm)

(a) 4 (b) 8

(c) 10 (d) 6

372. A solid cone of height 9 cm with diameter of its base 18 cm is cut out from a wooden solid sphere of radius 9 cm. The percentage of wood wasted is :

(a) 25% (b) 30%

(c) 50% (d) 75%

373. What is the height of a cylinder that has the same volume and radius as a sphere of diameter 12 cm?

(a) 7 cm (b) 10 cm

(c) 9 cm (d) 8 cm

374. The perimeter of the base of a right circular cone is 8 cm. If the height of the cone is 21 cm, then its volume is:

(a) 108 π cm^3 (b) $\frac{112}{\pi}$ cm^3

(c) 112π cm^3 (d) $\frac{108}{\pi}$ cm^3

375. If the volume of two right circular cones are in the ratio 4 : 1 and their diameter are in the ratio 5 : 4, then the ratio of their heights is:

(a) 25 : 16 (b) 25 : 64

(c) 64 : 25 (d) 16 : 25

376. The volume of a conical tent is 1232 cu. m and the area of its base is 154 sq. m. Find the length of the canvas required to build the tent, if the canvas is 2m in width. (Take $\pi = \frac{22}{7}$)

(a) 270 m (b) 272 m

(c) 276 m (d) 275 m

377. If the ratio of the diameters of two right circular cones of equal height be 3: 4, then the ratio of their volume will be

(a) 3 : 4 (b) 9 : 16

(c) 16 : 9 (d) 27 : 64

378. The surface area of two spheres are in the ratio 4 : 9. Their volumes will be in the ratio

(a) 2 : 3 (b) 4 : 9

(c) 8 : 27 (d) 64 : 729

379. The total surface area of a sphere is 8π square unit. The volume of the sphere is

(a) $\frac{8\sqrt{2}}{3}\pi$ cubic unit

(b) $\frac{8}{3}\pi$ cubic unit

(c) $8\sqrt{3}\pi$ cubic unit

(d) $\frac{8\sqrt{3}}{5}\pi$ cubic unit

380. A semicircular sheet of metal of diameter 28 cm is bent into an open conical cup. The capacity of the cup

(Take $\pi = \frac{22}{7}$) is

(a) 624.26 cm^3 (b) 622.36 cm^3

(c) 622.56 cm^3 (d) 623.20 cm^3

381. A conical flask is full of water. The flask has base radius r and height h. This water is poured into a cylindrical flask of base radius m, height of cylindrical flask is

(a) $\frac{m}{2h}$ (b) $\frac{h}{2}m^2$

(c) $\frac{2h}{m}$ (d) $\frac{r^2h}{3m^2}$

382. A solid spherical copper ball whose diameter is 14 cm is melted and converted into a wire having diameter equal to 14 cm. The length of the wire is

(a) 27 cm (b) $\frac{16}{3}$ cm

(c) 15 cm (d) $\frac{28}{3}$ cm

383. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is just completely submerged in water, then the rise of water level in the cylindrical vessel is:

(a) 2 cm (b) 1 cm

(c) 3 cm (d) 4 cm

384. A rectangular block of metal has dimensions 21 cm, 77 cm and 24 cm. The block has been melted into a sphere. The radius of the sphere is.

(Take $\pi = \frac{22}{7}$)

(a) 21 cm (b) 7 cm
(c) 14 cm (d) 28 cm

385. The radius of cross-section of a solid cylindrical rod of iron is 50 cm. The cylinder is melted down and formed into 6 solid spherical balls of the same radius as that of the cylinder. The length of the rod (in metres) is

(a) 0.8 (b) 2
(c) 3 (d) 4

386. Two right circular cones of equal height of radii of base 3 cm and 4 cm are melted together and made to a solid sphere of radius 5 cm. The height of a cone is

(a) 10 cm (b) 20 cm
(c) 30 cm (d) 40 cm

387. The radius of the base and the height of a right circular cone are doubled. The volume of the cone will be

(a) 8 times of the previous volume
(b) three times of the previous volume
(c) $3\sqrt{2}$ times of the previous volume
(d) 6 times of the previous volume

388. If h, c, v are respectively the height, curved surface area and volume of a right circular cone then the value of $3\pi vh^3 - c^2h^2 + 9v^2$ is

(a) 2 (b) – 1
(c) 1 (d) 0

389. The total number of spherical bullets, each of diameter 5 decimetre, that can be made by utilizing the maximum of a rectangular block of lead with 11 metre length, 10 metre breadth and 5 metre width is

(assume that $\left(\pi = \frac{22}{7}\right)$

(a) 8800 (b) 8500
(c) 8400 (d) 9000

390. If a metallic cone of radius 30 cm and height 45 cm is melted and recast into metallic spheres of radius 5 cm, find the number of spheres.

(a) 81 (b) 41
(c) 80 (d) 40

391. A metallic sphere of radius 10.5 cm is melted and then recast into small cones each of radius 3.5 cm and height 3 cm. The number of cones thus formed is

(a) 140 (b) 132
(c) 112 (d) 126

392. A right circular cone is 3.6 cm height and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base as 1.2 cm. Then the height of the cone (in cm) is

(a) 3.6 cm (b) 4.8 cm
(c) 6.4 cm (d) 7.2 cm

393. If surface area and volume of a sphere are S and V respectively, then value of $\frac{S^3}{V^2}$ is

(a) 36π units (b) 9π units
(c) 18π units (d) 27π units

394. Assume that a drop of water is spherical and its diameter is one-tenth of a cm. A conical glass has a height equal to the diameter of its rim. If 32,000 drops of water fill the glass completely. Then the height of the glass (in cm) is

(a) 1 (b) 2
(c) 3 (d) 4

395. A tank 40 m long, 30 m broad and 12 m deep is dug in a field 1000 m long and 30 m wide. By how much will the level of the field rise if the earth dug out of the tank is evenly spread over the field ?

(a) 2 metre (b) 1.2 metre
(c) 0.5 metre (d) 5 metre

396. A sphere is cut into two hemispheres. One of them is used as bowl. It takes 8 bowlfuls of this to fill a conical vessel of height 12 cm and radius 6 cm. The radius of the sphere (in centimetre) will be

(a) 3 (b) 2
(c) 4 (d) 6

397. A ball of lead 4 cm in diameter is covered with gold. If the volume of the gold and lead are equal then the thickness of gold [given $\sqrt[3]{2}$ = 1.259) is approximately

(a) 5.038 cm (b) 5.190 cm
(c) 1.038 cm (d) 0.518 cm

398. A conical cup is filled with icecream. The ice-cream forms a hemispherical shape on its open top. The height of the hemispherical part is 7 cm. the radius of the hemispherical part equals the height of the cone. Then the volume of the ice-cream is $\left[\pi = \frac{22}{7}\right]$

(a) 1078 cubic cm
(b) 1708 cubic cm
(c) 7108 cubic cm
(d) 7180 cubic cm

399. A hollow sphere of internal and external diameter 6 cm and 10 cm respectively is melted into a right circular cone of diameter 8 cm. The height of the cone is

(a) 22.5 cm (b) 23.5 cm
(c) 24.5 cm (d) 25.5 cm

400. A flask in the shape of a right circular cone of height 24 cm is filled with water. The water is poured in right circular cylindrical flask whose radius is $\frac{1}{3}$ rd of radius of the base of the circular cone. Then the height of the water in the cylindrical flask is

(a) 32 cm (b) 24 cm
(c) 48 cm (d) 72 cm

401. A solid metallic spherical ball of diameter 6 cm is melted and recast into a cone with diameter of the base as 12 cm. The height of the cone is

(a) 2 cm (b) 3 cm
(c) 4 cm (d) 6 cm

402. A hemispherical bowl of internal radius 15 cm contains a liquid. The liquid is to be filled into cylindrical shaped bottles of diameter 5 cm and height 6 cm. The number of bottles required to empty the bowl is

(a) 30 (b) 40
(c) 50 (d) 60

403. If V_1, V_2 and V_3 be the volumes of a right circular cone. a sphere and a right circular cylinder having the same radius and same height then

(a) $V_1 = \frac{V_2}{4} = \frac{V_3}{3}$ (b) $\frac{V_1}{2} = \frac{V_2}{3} = V_3$

(c) $\frac{V_1}{3} = \frac{V_2}{2} = V_3$ (d) $\frac{V_1}{3} = V_2 = \frac{V_3}{2}$

404. Deepali makes a model of a cylindrical kaleidoscope for her science project. She uses a chart paper to make it. If the length of the kaleidoscope is 25 cm and radius 35 cm, the area of the paper she used, in sq. cm, is $\left(\pi = \frac{22}{7}\right)$

(a) 1100 (b) 5500

(c) 500 (d) 450

405. 5 persons live in a tent. If each person requires 16 m^2 of floor area and 100 m^3 space for air then the height of the cone of smallest size to accomodate these persons would be?

(a) 16 m (b) 18.75 m

(c) 10.25 m (d) 20 m

(SSC CGL 16–08–2015 Morning)

406. The numerical values of the volume and the area of the lateral surface of a right circular cone are equal. If the height of the cone be h and radius be r, the value of $\frac{1}{h^2}+\frac{1}{r^2}$ is

(a) $\frac{9}{1}$ (b) $\frac{3}{1}$

(c) $\frac{1}{3}$ (d) $\frac{1}{9}$

407. There is wooden sphere of radius $6\sqrt{3}$ cm. The surface area of the largest possible cube cut out from the sphere will be

(a) $464\sqrt{3}$ cm^2 (b) $646\sqrt{3}$ cm^2

(c) 864 cm^2 (d) 462 cm^2

(CGL mains 25–10–2015)

408. If a hemisphere is melted and four spheres of equal volume are made, the radius of each sphere will be equal to

(a) 1/4th of the hemisphere

(b) radius of the hemisphere

(c) 1/2 of the radius of the hemisphere

(d) 1/6th of the radius of the hemisphere

(CGL mains 25–10–2015)

409. A spherical ball of radius 1 cm is dropped into a conical vessel of radius 3 cm and slant height 6 cm. The volume of water (in cm^3), that can just immerse the ball, is

(a) $\frac{5\pi}{3}$ (b) 3π

(c) $\frac{\pi}{3}$ (d) $\frac{4\pi}{3}$

(CGL Mains 12–04–2015)

410. If the height of a cylinder is 4 times its circumference, the volume of the cylinder in terms of its circumference, c is

(a) $\frac{2c^3}{\pi}$ (b) $\frac{c^3}{\pi}$

(c) $4\pi c^3$ (d) $2\pi c^3$

(CGL Mains 12–04–2015)

411. The radii of a sphere and a right circular cylinder are 3 cm each. If their volumes are equal, then curved surface area of the cylinder is $\left(\text{Assume } \pi = \frac{22}{7}\right)$

(a) $75\frac{3}{7}$ cm^2 (b) $65\frac{3}{7}$ cm^2

(c) $74\frac{3}{7}$ cm^2 (d) $72\frac{3}{7}$ cm^2

(SSC LDC 01–11–2015, Morning)

412. The total surface area of a right circular cylinder with radius of the base 7 cm and height 20 cm is:

(a) 140 cm^2 (b) 1000 cm^2

(c) 900 cm^2 (d) 1188 cm^2

(SSC LDC 15–11–2015, Morning)

413. The radius of base and curved surface area of a right cylinder 'r' units and $4\pi rh$ square units respec- tively The height of the cylinder is:

(a) 4h units (b) $\frac{h}{2}$ units

(c) h units (d) 2h units

(SSC LDC 15–11–2015, Morning)

414. A hemi-spherical bowl has 3.5 cm radius. It is to be painted inside as well as outside. The cost of painting it at the rate of ₹ 5 per 10sq. cm. will be:

(a) ₹ 77 (b) ₹ 175

(c) ₹ 50 (d) ₹ 100

(SSC LDC 15–11–2015, Morning)

415. The volume of a right circular cone which is obtained from a wooden cube of edge 4.2 dm wasting minimum amount of wood is:

(a) 194.04 cu. dm

(b) 19.404 cu. dm

(c) 1940.4 cu. dm

(d) 19404 cu. dm

(SSC LDC 15–11–2015, Evening)

416. A right triangle with sides 9 cm, 12 cm and 15 cm is rotated about the side of 9 cm to form a cone. The volume of the cone so formed is:

(a) $432\ \Pi\ cm^3$ (b) $327\ \Pi\ cm^3$

(c) $334\ \Pi\ cm^3$ (d) $324\ \Pi\ cm^3$

(SSC LDC 06–12–2015, Morning)

417. The volume of the largest right circular cone that can be cut out of a cube of edge 7 cm ? (use $\pi = \frac{22}{7}$)

(a) 13.6 cm^3 (b) 147.68 cm^3

(c) 89.8 cm^3 (d) 121 cm^3

(SSC LDC 06–12–2015, Evening)

418. By melting two solid metallic spheres of radii 1 cm and 6 cm, a hollow sphere of thickness 1 cm is made. The external radius of the hollow sphere will be

(a) 8 cm (b) 9 cm

(c) 6 cm (d) 7 cm

(SSC LDC 20–12–2015, Morning)

TYPE I

419. Water is flowing at the rate of 5 km/h through a pipe of diameter 14 cm into a rectangular tank which is 50 m long 44m wide, The time taken (in hours) for the rise in the level of water in the tank to be 7 cm is

(a) 2 (b) $1\frac{1}{2}$

(c) 3 (d) $2\frac{1}{2}$

420. The volume (in m^3) of rain water that can be collected from 1.5 hectares of ground in a rainfall of 5 cm is

(a) 75 (b) 750

(c) 7500 (d) 75000

421. A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour, How much water (in litres) will fall into sea in a minute?

(a) 4,00,000 m^3 (b) 40,00,000 m^3

(c) 40,000 m^3 (d) 4,000 m^3

422. Water is flowing at the rate of 3 km/hr through a circular pipe of 20 cm internal diameter into a circular cistern of diameter 10 m and depth 2m. In how much time will the cistern be filled?
(a) 1 hour
(b) 1 hour 40 minutes
(c) 1 hour 20 minutes
(d) 2 hours 40 minutes

423. Water flows at the rate of 10 metres per minute from cylindrical pipe 5 mm in diameter, How long it will take to fill up a conical vessel whose diameter at the base is 30 cm and depth 24 cm?
(a) 28 minutes 48 seconds
(b) 51 minutes 12 seconds
(c) 51 minutes 24 seconds
(d) 28 minutes 36 seconds

424. The radius of the base of conical tent is 12 m. The tent is 9 m high. Find the cost of canvas required to make the tent, if one square metre of canvas costs ₹120 (Take π = 3.14)
(a) ₹67,830 (b) ₹67,800
(c) ₹67,820 (d) ₹67,824

425. A plate of square base made of brass is of length x cm and thickness 1 mm.The plate weighs 4725 gm. If 1 cubic cm of brass weighs 8.4 gram, then the value of x is:
(a) 76 (b) 72
(c) 74 (d) 75

(SSC LDC 15–11–2015, Evening)

426. The diameter of a 120 cm long roller is 84 cm. It takes 500 complete revolutions of the roller to level a ground. The cost of levelling the ground at ₹1.50 sq. m. is:
(a) ₹ 5750 (b) ₹ 6000
(c) ₹ 3760 (d) ₹ 2376

(SSC LDC 06–12–2015, Morning)

TYPE J

427. If the volume of two cubes are in the ratio 27 : 1, the ratio of their edge is :
(a) 3 : 1 (b) 27 : 1
(c) 1 : 3 (d) 1 : 27

428. The edges of a cuboid are in the ratio 1 : 2 : 3 and its surface area is 88cm^2. The volume of the cuboid is:
(a) 48 cm^3 (b) 64 cm^3
(c) 16 cm^3 (d) 100 cm^3

429. The base radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is:
(a) 27 : 20 (b) 20 : 27
(c) 9 : 4 (d) 4 : 9

430. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3 (Taking $\pi = \frac{22}{7}$). find the ratio of its diameter to its height .
(a) 7 : 6 (b) 6 : 7
(c) 3 : 7 (d) 7 : 3

431. The ratio of the volume of two cones is 2 : 3 and the ratio of radii of their base is 1 : 2. The ratio of their heights is
(a) 3 : 8 (b) 8 : 3
(c) 4 : 3 (d) 3 : 4

432. If the volume of two cubes are in the ratio 27 : 64, then the ratio of their total surface area is:
(a) 27 : 64 (b) 3 : 4
(c) 9 : 16 (d) 3 : 8

433. A hemisphere and a cone have equal base . If their heights are also equal to their base, the ratio of their curved surface will be:
(a) $1:\sqrt{2}$ (b) $\sqrt{2}:1$
(c) 1 : 2 (d) 2 : 1

434. If the height of a given cone be doubled and radius of the base remains the same the ratio of the volume of the given cone to that of the second cone will be
(a) 2 : 1 (b) 1 : 8
(c) 1 : 2 (d) 8 : 1

435. Spheres A and B have their radii 40 cm and 10 cm respectively. Ratio of surface area of A to the surface area of B is :
(a) 1 : 16 (b) 4 : 1
(c) 1 : 4 (d) 16 : 1

436. A cube of edge 5 cm is cut into cubes each of edge of 1 cm. The ratio of the total surface area of one of the smaller cubes to that of the larger cube is equal to:
(a) 1 : 125 (b) 1 : 5
(c) 1 : 625 (d) 1 : 25

437. The diameter of two hollow spheres made from the same metal sheet are 21 cm and 17.5 cm respectively. The ratio of the area of metal sheets required for making the two spheres is
(a) 6 : 5 (b) 36 : 25
(c) 3 : 2 (d) 18 : 25

438. By melting a solid lead sphere of diameter 12 cm, three small spheres are made whose diameters are in the ratio 3 : 4 : 5. The radius (in cm) of the smallest sphere is
(a) 3 (b) 6
(c) 1.5 (d) 4

439. A cone is cut at mid point of its height by a frustum parallel to its base. The ratio between the volumes of two parts of cone would be
(a) 1 : 1 (b) 1 : 8
(c) 1 : 4 (d) 1 : 7

440. The ratio of the area of the in-circle and the circum-circle of a square is
(a) 1 : 2 (b) $\sqrt{2}:1$
(c) $1:\sqrt{2}$ (d) 2 : 1
(e) Remains unchanged

441. The ratio of the surface area of a sphere and the curved surface area of the cylinder circumscribing the sphere is
(a) 1 : 2 (b) 1 : 1
(c) 2 : 1 (d) 2 : 3

442. The volume of a sphere and a right circular cylinder having the same radius is equal. The ratio of the diameter of the sphere to the height of the cylinder is
(a) 3 : 2 (b) 2 : 3
(c) 1 :2 (d) 2 : 1

443. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. The ratio of their respective volume is
(a) 1 : 2 : 3 (b) 2 : 1 : 3
(c) 1 : 3 : 2 (d) 3 : 1 : 2

444. The radii of the base of two cylinders A and B are in the ratio 3 : 2 and their height in the ratio x : 1. If the volume of cylinder A is 3 times that of cylinder B, the value of x is
(a) $\frac{4}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) $\frac{3}{2}$

445. A solid metallic sphere of radius 8 cm is melted to form 64 equal small solid spheres. The ratio of the surface area of this sphere to that of a small sphere is
(a) 4 : 1 (b) 1 :16
(c) 16 :1 (d) 1 : 4

446. The diameter of two cylinders, whose volumes are equal, are in the ratio 3 : 2, Their heights will be in the ratio.
(a) 4 : 9 (b) 5 : 6
(c) 5 : 8 (d) 8 : 9

447. The ratio of radii of two cone is 3 : 4 and the ratio of their height is 4 : 3. Then the ratio of their volume will be
(a) 3 : 4 (b) 4 : 3
(c) 9 : 16 (d) 16 : 9

448. If a right circular cone is separated into solids of volumes V_1, V_2, V_3 by two planes parallel to the base which also trisect the altitude, then $V_1 : V_2 : V_3$ is
(a) 1 : 2 : 3 (b) 1 : 4 : 6
(c) 1 : 6 : 9 (d) 1 : 7 : 19

449. The total surface area of a solid right circular cylinder is twice that of a solid sphere. If they have the same radii, the ratio of the volume of the cylinder to that of the sphere is given by
(a) 9 : 4 (b) 2 : 1
(c) 3 : 4 (d) 4 :9

450. The respective height and volume of a sphere and a right circular cylinder are equal, then the ratio of their radii is
(a) $\sqrt{2}:\sqrt{3}$ (b) $\sqrt{3}:1$
(c) $\sqrt{3}:2$ (d) $2:\sqrt{3}$

451. The ratio of the volume of a cube and of a solid sphere is 363 : 49. The ratio of an edge of the cube and the radius of the sphere is (take $\pi = \frac{22}{7}$)
(a) 7 : 11 (b) 22 : 7
(c) 11 :7 (d) 7 : 22

452. The radius and the height of a cone are in the ratio 4 : 3. The ratio of the curved surface area and total surface area of the cone is
(a) 5 : 9 (b) 3 : 7
(c) 5 : 4 (d) 16 : 9

453. A sphere and a cylinder have equal volume and equal radius. The ratio of the curved surface area of the cylinder to that of the sphere is
(a) 4 : 3 (b) 2 : 3
(c) 3 : 2 (d) 3 : 4

454. A right circular cylinder and a cone have equal base radius and equal height. If their curved surfaces are in the ratio 8 : 5, then the radius of the base to the height are in the ratio:
(a) 2 : 3 (b) 4 : 3
(c) 3 : 4 (d) 3 : 2

455. The radii of the base of cylinder and a cone are in the ratio $\sqrt{3}:\sqrt{2}$ and their heights are in the ratio $\sqrt{2}:\sqrt{3}$. Their volumes are in the ratio of
(a) $\sqrt{3}:\sqrt{2}$ (b) $3\sqrt{3}:\sqrt{2}$
(c) $\sqrt{3}:2\sqrt{2}$ (d) $\sqrt{2}:\sqrt{6}$

456. The diameter of the moon is assumed to be one fourth of the diameter of the earth. Then the ratio of the volume of the earth to that of the moon is
(a) 64 : 1 (b) 1 : 64
(c) 60 : 7 (d) 7 : 60

457. If A denotes the volume of a right circular cylinder of same height as its diameter and B is the volume of a sphere of same radius then $\frac{A}{B}$ is :
(a) $\frac{4}{3}$ (b) $\frac{3}{2}$
(c) $\frac{2}{3}$ (d) $\frac{3}{4}$

458. A sphere and a hemisphere have the same volume. The ratio of their curved surface area is:
(a) $2^{\frac{3}{2}}:1$ (b) $2^{\frac{2}{3}}:1$
(c) $4^{\frac{2}{3}}:1$ (d) $2^{\frac{1}{3}}:1$

459. The volume of a cylinder and a cone is in the ratio 3 : 1. Find their diameters and then compare them when their heights are equal.
(a) Diameter of cylinder = 2 times of diameter of cone
(b) Diameter of cylinder = Diameter of cone
(c) Diameter of cylinder > Diameter of cone
(d) Diameter of cylinder < Diameter of cone

460. A solid sphere is melted and recast into a right circular cone with a base radius equal to the radius of sphere. What is the ratio of the height and radius of the cone so formed ?
(a) 4 : 3 (b) 2 : 3
(c) 3 : 4 (d) 4 : 1

461. The ratio of weights of two spheres of different materials is 8 : 17 and the ratio of weights per 1 cc of materials of each is 289 : 64. The ratio of radii of the two spheres is
(a) 8 : 17 (b) 4 : 17
(c) 17 : 4 (d) 17 : 8

462. The volumes of a right circular cylinder and a sphere are equal. The radius of the cylinder and the diameter of the sphere are equal. The ratio of height and radius of the cylinder is
(a) 3 : 1 (b) 1 : 3
(c) 6 : 1 (d) 1 : 6

463. A large solid sphere is melted and moulded to form identical right circular cones with base radius and height same as the radius of the sphere. One of these cones is melted and moulded to form a smaller solid sphere. Then the ratio of the surface area of the smaller sphere to the surface area of the larger sphere is
(a) $1:3^{\frac{4}{3}}$ (b) $1:2^{\frac{3}{2}}$
(c) $1:3^{\frac{2}{3}}$ (d) $1:2^{\frac{4}{3}}$

(CGL mains 25–10–2015)

464. A plane divides a right circular cone into two parts of equal volume. If the plane is parallel to the base, then the ratio, in which the height of the cone is divided, is
(a) $1:\sqrt{2}$ (b) $1:\sqrt[3]{2}$
(c) $1:\sqrt[3]{2}-1$ (d) $1:\sqrt[3]{2}+1$

(CGL mains 25–10–2015)

465. On increasing each side of a square by 50%, the ratio of the area of new formed square and the given square will be
(a) 9 : 5 (b) 9 :7
(c) 9 : 3 .5 (d) 9 : 4

(CGL Mains 12–04–2015)

TYPE K

466. A cone of height 7 cm and base radius 1 cm is carved from a cuboidal block of wood 10 cm × 5 cm × 2 cm .[Assuming $\pi = \frac{22}{7}$] The percentage wood wasted in the process is:

(a) $92\frac{2}{3}\%$ (b) $46\frac{1}{3}\%$

(c) $42\frac{1}{3}\%$ (d) $41\frac{1}{3}\%$

467. If the radius of a cylinder is decreased by 50% and the height is increased by 50% to form a new cylinder, the volume will be decreased by

(a) 0% (b) 25%

(c) 62.5% (d) 75%

468. Each of the height and base radius of a cone is increased by 100%. The percentage increase in the volume of the cone is

(a) 700% (b) 400%

(c) 300% (d) 100%

469. A cone of height 15 cm and base diameter 30 cm is carved out of a wooden sphere of radius 15 cm. The percentage of used wood is :

(a) 75% (b) 50%

(c) 40% (d) 25%

470. If the height of a right circular cone is increased by 200% and the radius of the base is reduced by 50%, the volume of the cone is:

(a) increases by 25%

(b) increases by 50%

(c) remains unaltered

(d) decreases by 25%

471. If the height and the radius of the base of a cone are each increased by 100%, then the volume of the cone becomes

(a) double that of the original

(b) three times that of the original

(c) six times that of the original

(d) eight times that of the original

472. If the height of a cylinder is increased by 15 per cent and the radius of its base is decreased by 10 percent then by what percent will its curved surface area change?

(a) 3.5 percent decrease

(b) 3.5 percent increase

(c) 5 percent increase

(d) 5 percent decrease

473. If the radius of a right circular cylinder is decreased by 50% and its height is increased by 60% its volume will be decreased by

(a) 10% (b) 60%

(c) 40% (d) 20%

474. The length, breadth and height of a cuboid are in the ratio 1 : 2 : 3. If they are increased by 100%, 200% and 200% respectively. then compared to the original volume the increase in the volume of the cuboid will be

(a) 5 times (b) 18 times

(c) 12 times (d) 17 times

475. Each of the radius of the base and the height of a right circular cylinder is increased by 10%. The volume of the cylinder is increased by

(a) 3.31% (b) 14.5%

(c) 33.1% (d) 19.5%

476. If the height of a cone is increased by 100% then its volume is increased by :

(a) 100% (d) 200%

(d) 300% (d) 400%

477. A hemispherical cup of radius 4 cm is filled to the brim with coffee. The coffee is then poured into a vertical cone of radius 8 cm and height 16 cm. The percentage of the volume of the cone that remains empty is :

(a) 87.5% (b) 80.5%

(c) 81.6% (d) 88.2%

478. The height of a circular cylinder is increased six times and the base area is decreased to one ninth of its value. The factor by which the lateral surface of the cylinder increases is

(a) 2 (b) $\frac{1}{2}$

(c) $\frac{2}{3}$ (d) $\frac{3}{2}$

479. If the radius of a sphere be doubled. the area of its surface will become

(a) Double

(b) Three times

(c) Four times

(d) None of the mentioned

TYPE L

480. If the length of each side of a regular tetrahedron is 12 cm, then the volume of the tetrahedron is

(a) $144\sqrt{2}$ cu. cm,

(b) $72\sqrt{2}$ cu. cm,

(c) $8\sqrt{2}$ cu. cm,

(d) $12\sqrt{2}$ cu. cm,

481. If the radii of the circular ends of a frustum which is 45cm high be 28 cm and 7 cm then the capacity of the bucket in cubic centimetre is

(use $\pi = \frac{22}{7}$)

(a) 48510 (b) 45810

(c) 48150 (d) 48051

482. There is a pyramid on a base which is a regular hexagon of side 2a cm. If every slant edge of this pyramid is of length $\frac{5a}{2}$ cm, then the volume of this pyramid is

(a) $3a^3$ cm³ (b) $3\sqrt{2}\,a^2$ cm³

(c) $3\sqrt{3}\,a^3$ cm³ (d) $6a^3$ cm³

483. The base of a right pyramid is a square of side 40 cm long. If the volume of the pyramid is 8000 cm³, then its height is:

(a) 5 cm (b) 10 cm

(c) 15 cm (d) 20 cm

484. The base of a right prism is a trapezium. The length of the parallel sides are 8 cm and 14 cm and the distance between the parallel sides is 8 cm, If the volume of the prism is 1056 cm³, then the height of the prism is

(a) 44 cm (b) 16.5 cm

(c) 12 cm (d) 10.56 cm

485. The perimeter of the triangular base of a right prism is 15 cm and radius of the incircle of the triangular base is 3 cm. If the volume of the prism be 270 cm³ then the height of the prism is

(a) 6 cm (b) 7.5 cm

(c) 10 cm (d) 12 cm

486. The base of a solid right prism is a triangle whose sides are 9 cm, 12 cm and 15 cm, The height of the prism is 5 cm. Then the total surface area of the prism is

(a) 180 cm² (b) 234 cm²

(c) 288 cm² (d) 270 cm²

487. The base of a right prism is an equilateral triangle of area 173 cm^2 and the volume of the prism is 10380 cm^3. The area of the lateral surface of the prism is

(use $\sqrt{3}$ =1.73)

(a) 1200 cm^2 (b) 2400 cm^2
(c) 3600 cm^2 (d) 4380 cm^2

488. The base of a right pyramid is a square of side 16 cm long . If its height be 15 cm, then the area of the lateral surface in square cm is :

(a) 136 (b) 544
(c) 800 (d) 1280

489. Area of the base of a pyramid is 57 sq. cm. and height is 10 cm, then its volume (in cm^3), is

(a) 570 (b) 390
(c) 190 (d) 590

490. The height of a right prism with a square base is 15 cm. If the area of the total surface of the prism is 608 sq. cm, its volume is

(a) 910 cm^3 (b) 920 cm^3
(c) 960 cm^3 (d) 980 cm3

491. The base of a right prism is an equilateral triangle of side 8 cm and height of the prism is 10 cm. Then the volume of the prism is

(a) $320\sqrt{3}$ cubic cm
(b) $160\sqrt{3}$ cubic cm
(c) $150\sqrt{3}$ cubic cm
(d) $300\sqrt{3}$ cubic cm

492. A prism has base a right angled triangle whose sides adjacent to the right angles are 10 cm and 12 cm long. The height of the prism is 20 cm. the density of the material of the prism is 6gm/cubic cm. the weight of the prism is

(a) 6.4 kg (b) 7.2 kg
(c) 3.4 kg (d) 4.8 kg

493. If the slant height of a right pyramid with square base is 4 metre and the total slant surface of the pyramid is 12 square metre, then the ratio of total slant surface area and area of the base is:

(a) 16 : 3 (b) 24 : 5
(c) 32 : 9 (d) 12 : 3

494. If the base of a right pyramid is triangle of sides 5 cm, 12 cm and 13 cm and its volume is 330 cm, then its height (in cm) will be

(a) 33 (b) 32
(c) 11 (d) 22

495. The base of a right pyramid is equilateral triangle of side $10\sqrt{3}$ cm. If the total surface area of the pyramid is $270\sqrt{3}$ sq. cm. its height is

(a) $12\sqrt{3}$ cm (b) 10 cm
(c) $10\sqrt{3}$ cm (d) 12 cm

496. A right prism stands on a base of 6 cm side equilateral triangle and its volume is $81\sqrt{3}$ cm^3. the height (in cm) of the prism is

(a) 9 (b) 10
(c) 12 (d) 15

497. A right pyramid stands on a square base of diagonal $10\sqrt{2}$ cm. If the height of the pyramid is 12 cm, the area (in cm^2) of its slant surface is

(a) 520 (b) 420
(c) 360 (d) 260

498. If the altitude of a right prism is 10 cm and its base is an equilateral triangle of side 12 cm, then its total surface area (in cm^2) is

(a) $\left(5+3\sqrt{3}\right)$
(b) $36\sqrt{3}$
(c) 360
(d) $72\left(5+\sqrt{3}\right)$

499. A right pyramid 6 m high has a square base of which the diagonal is $\sqrt{1152}$ m. Volume of the pyramid is

(a) 144 m^3 (b) 288 m^3
(c) 576 m^3 (d) 1152 m^3

500. The height of the right pyramid whose area of the base is 30 m^2 and volume is 500 m^2 is

(a) 50 m (b) 60 m
(c) 40 m (d) 20 m

501. The base of a right. prism is an equilateral triangle. If the lateral surface area and volume are 120 cm^2, $40\sqrt{3}$ cm^3 respectively then the side of base of the prism is

(a) 4 cm (b) 5 cm
(c) 7 cm (d) 40 cm

502. The base of a right prism is a quadrilateral ABCD, given that AB = 9 cm, BC = 14 cm, CD = 13 cm, DA = 12 cm and $\angle DAB = 90°$. If the volume of the prism be 2070 cm^3, then the area of the lateral surface is

(a) 720 cm^2 (b) 810 cm^2
(c) 1260 cm^2 (d) 2070 cm^2

503. If the area of the base, height and volume of a right prism be $\left(\frac{3\sqrt{3}}{2}\right)$ p^2 cm^2, $100\sqrt{3}$ cm and 7200 cm^3 respectively, then the value of P (in cm) will be ?

(a) 4 (b) $\frac{2}{\sqrt{3}}$
(c) $\sqrt{3}$ (d) $\frac{3}{2}$

(SSS CGL 16–08–2015 Evening)

504. If the base of right prism remains same and the lateral edges are halved, then its volume will be reduced by

(a) 33.33% (b) 50%
(c) 25% (d) 66%

(CPO 21–06–2015 Morning)

505. The total surface area of a regular triangular pyramid with each edges of length 1 cm is?

(a) $\frac{4}{2}\sqrt{2}$ cm^2 (b) $\sqrt{3}$ cm^2
(c) 4 cm^2 (d) $4\sqrt{3}$ cm^2

(CPO 21–06–2015 Morning)

506. Base of a right pyramid is a square of side 10 cm. If the height of the pyramid is 12 cm, then its total surface area is

(a) 360 cm^2 (b) 400 cm^2
(c) 460 cm^2 (d) 260 cm^2

(CGL mains 25–10–2015)

507. A right prism has a triangular base whose sides are 13 cm, 20 cm and 21 cm, If the altitude of the prism is 9 cm, then its volume is

(a) 1143 cm^3 (b) 1314 cm^3
(c) 1413 cm^3 (d) 1134 cm^3

(CGL mains 25–10–2015)

508. Base of a prism of height 10 cm is square. Total surface area of the prism is 192 sq. cm. The volume of the prism is
(a) 120 cm^3 (b) 640 cm^3
(c) 90 cm^3 (d) 160 cm^3
(SSC LDC 01–11–2015, Morning)

509. A right prism has triangular base. If v be the number of vertices, e be the number of edges and f be the number of faces of the prism. The value of $\frac{v+e-f}{2}$ is
(a) 2 (b) 4
(c) 5 (d) 10
(SSC LDC 01–11–2015, Morning)

510. The base of a right prism is a trapezium whose lengths of two parallel sides are 10 cm and 6 cm and distance between them is 5 cm. If the height of the prism is 8 cm, its volume is:
(a) 300 cm^3 (b) 300.5 cm^3
(c) 320 cm^3 (d) 310 cm^3
(SSC LDC 01–11–2015, Evening)

511. Base of a right prism is a rectangle, the ratio of whose length and breadth is 3 : 2. If the height of the prism is 12 cm and total surface area is 288 sq. cm, the volume of the prism is:
(a) 288 cm^3 (b) 290 cm^3
(c) 286 cm^3 (d) 291 cm^3
(SSC LDC 15–11–2015, Evening)

512. Height of a prism-shaped part of a machine is 8 cm and its base is an isosceles triangle, whose each of the equal sides is 5 cm and remaining side is 6 cm. The volume of the part is
(a) 90 cm^3 (b) 96 cm^3
(c) 120 cm^3 (d) 86 cm^3
(SSC LDC 20–12–2015, Morning)

513. A cylindrical rod of radius 30 cm and length 40 cm is melted and made into spherical balls of radius 1 cm. The number of spherical balls is.
(a) 40000 (b) 90000
(c) 27000 (d) 36000
(SSC CPO 20-03-2016, Morning)

514. The radii of the base of a cylinder and a cone are equal and their volumes are also equal. Then the ratio of their heights is
(a) 1 :2 (b) 2 : 1
(c) 1 : 4 (d) 1 : 3
(SSC CPO 20-03-2016, Morning)

515. The curved surface area of a cylinder with its height equal to the radius, is equal to the curved surface area of a sphere. The ratio of volume of the cylinder to that of sphere is:
(a) $3 : 2\sqrt{2}$ (b) $\sqrt{2} : 3$
(c) $2\sqrt{2} : 3$ (d) $3 : \sqrt{2}$
(SSC CPO 20-03-2016, Morning)

516. The radius of a wire is decreased to one third. If volume remains the same, length will increase by:
(a) 3 times (b) 1 times
(c) 9 times (d) 6 times
(SSC CPO 20-03-2016, Evening)

517. Let ABCDEF be a prism whose base is a right angled triangle, where sides adjacent to 90° are 9 cm and 12 cm, If the cost of painting the prism is Rs. 151.20 at the rate of 20 paisa per sq cm then the height of the prism is:
(a) 16 cm (b) 17 cm
(c) 18 cm (d) 15 cm
(SSC CPO 20-03-2016, Evening)

518. If the area of a square is increased by 44%, retaining its shape as a square, each of its sides increases by :
(a) 20% (b) 19%
(c) 22% (d) 21%
(SSC CPO 20-03-2016, Evening)

519. If the perimeter of an isosceles right angled triangle is $\left(\sqrt{2}+1\right)$ cm, then the length of the hypotenuse is:
(a) 2 cm (b) 2 cm
(c) $\sqrt{2}$ cm (d) 1 cm
(SSC CPO(Re Ex.) 04-06-2016, Morning)

520. A sphere is circumscribed and inscribed about two different cubes respectively. Find the ratio of volume of these cubes.
(a) $1 : 3\sqrt{3}$ (b) $2\sqrt{2} : 1$
(c) $\sqrt{3:1}$ (d) $\sqrt{2:1}$
(SSC CPO(Re Ex.) 04-06-2016, Evening)

521. Three small hemispheres of radii 1 cm, 2 cm and 3 cm are melted to form a sphere. What will be the approximate radius of the new sphere?
(a) 2.6 cm (b) 3.2 cm
(c) 3.6 cm (d) 2.8 cm
(SSC CPO(Re Ex.) 05-06-2016, Morning)

522. A sphere, a cylinder and a cone have equal radius and volume. What is the ratio of radius of sphere: height of the cylinder: height of cone?
(a) 3 : 4 : 12 (b) 4 : 3 : 7
(c) 1 : 2 : 4 (d) 3 : 12 : 4
(SSC CPO(Re Ex.) 05-06-2016, Evening)

523. A triangle with sides 3 cm, 4 cm and 5 cm is rotated with 3 cm and 4 cm sides as the heights one by one to form 2 different cones. The volumes of the cones so formed will be in the ratio of:
(a) 4 : 3 (b) 3 : 4
(c) 27 : 64 (d) 64 : 27
(SSC CPO(Re Ex.) 05-06-2016, Evening)

524. The radii of a sphere and cylinder are 6 cm each. If their volumes are equal, then the curved surface area of the cylinder is:
(a) 32π cm^2 (b) 96π cm^2
(c) 44π cm^2 (d) 54π cm^2
(SSC CPO(Re Ex.) 06-06-2016, Morning)

525. A ground circular in shape has a footpath 3.5 m wide around it on the outside. What is the cost of cementing the path at ₹ 4 per m^2, given the diameter of the ground is 56 m?
(a) ₹ 2618 (b) ₹ 2582
(c) ₹ 2682 (d) ₹ 2512
(SSC CPO(Re Ex.) 06-06-2016, Evening)

526. The shape of an object is a right circular cyclinder with a hemisphere on bottom and a right circular cone on the top. The radius of the cyclindrical part is 5 cm and the height of cylinder part is 2.6 times the radius. What is the total height of the object, if the surface area of the object is 770 cm^2?
(a) 18 cm (b) 35 cm
(c) 12 cm (d) 30 cm
(SSC CPO(Re Ex.) 07-06-2016, Morning)

527. The perimeter of a triangle is 67 cm. The first side is twice the length of the second side. The third side is 11 cm more than the second side. Find the length of the shortest side of the triangle?
(a) 12 cm (b) 14 cm
(c) 17 cm (d) 25 cm
(SSC CPO(Re Ex.) 07-06-2016, Morning)

528. The sides of a rectangle with dimension 7 cm × 11 cm are joined to form a cylinder with height 11 cm. What is the volume of this cyclinder?
(a) 85.75 cm^3 (b) 86.92 cm^3
(c) 54.25 cm^3 (d) 42.875 cm^3
(SSC CPO(Re Ex.) 07-06-2016, Morning)

529. The perimeter of a certain isosceles right triangle is $10 + 10\sqrt{2}$ cm. What is the length of the hypotenuse of the triangle?
(a) 5 cm (b) 10 cm
(c) $5\sqrt{2}$ cm (d) $10\sqrt{2}$ cm
(SSC CPO(Re Ex.) 08-06-2016, Morning)

530. The area of a rhombus of which one side is 25 cm and diagonal is 30 cm is:
(a) 600 sq cm (b) 750 sq cm
(c) 500 sq cm (d) 550 sq cm
(SSC CPO(Re Ex.) 08-06-2016, Morning)

531. A silver cube of 2.2 cm side is melted and drawn into a wire of diameter 1 mm. What will be the approximate length of the wire?
(a) 1.35 m (b) 13.5 m
(c) 135 m (d) 1350 m
(SSC CPO(Re Ex.) 08-06-2016, Evening)

532. A conical tent is to be built 4 m in diameter and a slant height of 5.6 m. What will be the cost of canvas required to build this tent at the rate of Rs. 3.2 per square metre?
(a) Rs. 112.64 (b) Rs. 110
(c) Rs. 114.4 (d) Rs. 108.3
(SSC CPO(Re Ex.) 08-06-2016, Evening)

533. Two concentric circles are drawn with radii 12 cm and 13 cm. What will be the length of any chord of the larger circle that is tangent to the smaller circle?
(a) 5 cm (b) 8 cm
(c) 10 cm (d) 25 cm
(SSC CPO(Re Ex.) 08-06-2016, Evening)

534. The Diagonals of two squares are in the ratio of 3 : 7. What is the ratio of their areas?
(a) 3 : 7 (b) 9 : 49
(c) 4 : 7 (d) 7 : 3
(SSC CPO(Re Ex.) 09-06-2016, Morning)

535. If the number of sides of a regular polygon is 10, then the number of diagonals is:
(a) 30 (b) 36
(c) 35 (d) 45
(SSC CPO(Re Ex.) 09-06-2016, Morning)

536. A steel cylinder of radius 3.5 cm and height 7 cm is melted to form bearings of radius 1 cm and thickness 8.75 mm. How many such bearings can be made?
(a) 55 (b) 64
(c) 36 (d) 98
(SSC CPO(Re Ex.) 09-06-2016, Morning)

537. A steel cylinder of radius 3.5 cm and height 7 cm is melted to form bearings of radius 1 cm. How many such bearings can be made, assuming that 9.75 cm^3 of steel goes waste in manufacturing?
(a) 57 (b) 62
(c) 65 (d) 64
(SSC CPO(Re Ex.) 09-06-2016, Evening)

538. A cylindrical tank of radius 5.6 m and depth of 'h' m is built by digging out earth. The sand taken out is spread all around the tank to form a circular embankment to a width of 7m. What is the depth of the tank if the height of the embankment is 1.97 m?
(a) 4.2 m (b) 7 m
(c) 8 m (d) 6.7 m
(SSC CPO(Re Ex.) 10-06-2016, Morning)

539. A string of length 24 cm is bent first into a square and then into a right-angled triangle by keeping one side of the square fixed as its base. Then the area of triangle equals to:
(a) 24 cm^2 (b) 60 cm^2
(c) 40 cm^2 (d) 28 cm^2
(SSC CPO(Re Ex.) 10-06-2016, Morning)

540. Two athletes start from the same point and move on a circular track of 600m. If they run in same direction at speeds of 1.5 m/s and 3.5 m/s, when will they cross each other the second time?
(a) 5 minutes (b) 6 minutes
(c) 10 minutes (d) 12 minutes
(SSC CPO(Re Ex.) 11-06-2016, Evening)

541. A spherical lead ball of radius 6 cm is melted and small lead balls of radius 3mm are made. The total number of possible small lead balls is___
(a) 4250 (b) 4000
(c) 8005 (d) 8000
(SSC CGL Pre Exam 2016)

542. The length of diagonals of a rhombus are 24 cm and 10 cm the perimeter of the rhombus (in cm) is:
(a) 52 (b) 56
(c) 68 (d) 72
(SSC CGL Pre Exam 2016)

543. The radius of a sphere and right circular cylinder is 'r'. Their volumes are equal. The ratio of the height and radius of the cylinder is:
(a) 3 : 1 (b) 2 : 1
(c) 3 : 2 (d) 4 : 3
(SSC CGL Pre Exam 2016)

544. Radius of cross section of a solid right circular cylindrical rod is 3.2dm. The rod is melted and 44 equal solid cubes of side 8 cm are formed. The length of the rod is
(Take π = 22/7)
(a) 56 cm
(b) 7 cm
(c) 5.6 cm
(d) 0.7 cm
(SSC CGL Pre Exam 2016)

545. A solid sphere of radius 9 cm is melted to form a right circular cylinder of same radius. The height of the cylinder so formed is
(a) 19 cm
(b) 27 cm
(c) 23 cm
(d) 25 cm
(SSC CGL Pre Exam 2016)

546. A right circular conical structure stands on a circular base of 21m diameter and is 14 m in height. The total cost of colour washing its curved surface at ₹ 6 per sq.m. is
(a) 4365 (b) 4465
(c) 3465 (d) 3365
(SSC CGL Pre Exam 2016)

547. Thousand solid metallic spheres of diameter 6 cm are melted and recast into a new solid sphere. The diameter of the new sphere (in cm) is
(a) 30 (b) 90
(c) 45 (d) 60
(SSC CGL Pre Exam 2016)

548. An inverted conical shaped vessel is filled with water to its brim. The height of the vessel is 8 cm and radius of the open end is 5 cm. When a few solid spherical metallic balls each of radius $\frac{1}{2}$ cm are dropped in the vessel, 25% water is overflowed. The number of balls is:

(a) 100 (b) 400

(c) 200 (d) 150

(SSC CGL Pre Exam 2016)

549. A sphere of radius 5 cm is melted to form a cone with base of same radius. The height (in cm) of the cone is

(a) 5 (b) 10

(c) 20 (d) 22

(SSC CGL Pre Exam 2016)

550. The area of the largest triangle that can be inscribed in a semicircle of radius 6m is

(a) 36 m^2 (b) 72 m^2

(c) 18m^2 (d) 12 m^2

(SSC CGL Pre Exam 2016)

551. The area of rectangle is 60 cm^2 and its perimeter is 34 cm, then length of the diagonal is

(a) 17 cm. (b) 11 cm.

(c) 15 cm. (d) 13 cm.

(SSC CGL Pre Exam 2016)

552. The perimeters of a square and a rectange are equal. If their area be 'A' m^2 and 'B' m^2 then correct statement is

(a) $A < B$ (b) $A \leq B$

(c) $A > B$ (d) $A \geq B$

(SSC CGL Pre Exam 2016)

553. The diagonal of a cuboid of length 5 cm, width 4 cm and height 3 cm is

(a) $5\sqrt{2}cm$ (b) $2\sqrt{5}cm$

(c) 12 cm (d) 10 cm

(SSC CGL Pre Exam 2016)

554. A rectangle with one side 4 cm is inscribed in a circle of radius 2.5 cm. The area of the rectangle is:

(a) 8 cm^2 (b) 12 cm^2

(c) 16 cm^2 (d) 20 cm^2

(SSC CGL Pre Exam 2016)

555. The area of the largest sphere (in cm^2) that can be drawn inside a square of side 18 cm is

(a) 972π (b) 11664π

(c) 36π (d) 288π

(SSC CGL Pre Exam 2016)

556. The area of the circle with radius Y is W. The difference between the areas of the bigger circle (radius with radius Y) and that of the smaller circle (with radius X) is W'. So X/Y is equal to

(a) $\sqrt{1-\frac{w^1}{w}}$ (b) $\sqrt{1+\frac{w^1}{w}}$

(c) $\sqrt{1+\frac{w}{w^1}}$ (d) $\sqrt{1-\frac{w}{w^1}}$

(SSC CGL Mains Exam 2016)

557. An elephant of length 4 m is at one corner of a rectangular cage of size (16 m × 30 m) and faces towards the diagonally opposite corner. If the elephant starts moving towards the diagonally opposite corner it takes 15 seconds to reach this corner. Find the speed of the elephant

(a) 1 m/sec (b) 2 m/sec

(c) 1.87 m/sec (d) 1.5 m/sec

(SSC CGL Mains Exam 2016)

558. If the area of three adjacent faces of a rectangular box which meet in corner are 12 cm^2, 15 cm^2 and 20 cm^2 respectively. Then the volume of the box is

(a) 3600 cm^3 (b) 300 cm^3

(c) 60 cm^3 (d) 180 cm^3

(SSC CGL Mains Exam 2016)

559. The ratio between the length and the breadth of a rectangular park is 3 : 2 . If a man cycling along the boundary of the park at the speed of 12 km/hour completes one rounds in 8 minutes, then the area of the park is

(a) 153650 m^2 (b) 135600 m^2

(c) 153600 m^2 (d) 156300 m^2

(SSC CGL Mains Exam 2016)

560. If the radius of a right circular cylinder open at both the ends, is decreased by 25% and the height of the cylinder is increased by 25% . Then the curved surface area of the cylinder thus formed is:

(a) renains unalterd

(b) is increased by 25%

(c) is increased by 6.25%

(d) is decreased by 6.25%

(SSC CGL Mains Exam 2016)

561. A cylindrical pencil of diameter 1.2 cm has one of its end sharpened into a conical shape of height 1.4 cm. The volume of the material removed is

(a) 1.056 cm^3 (b) 4.224 cm^3

(c) 1.056 cm^3 (d) 42.24 cm^3

(SSC CGL Mains Exam 2016)

562. A rectangular park 60 m long and 40 m wide has two concrete crossroads runing in the middle of the park and rest of the park had been used as a lawn. If the area of the lawn is 2109 m^2 then the width of the road is

(a) 3 m (b) 5 m

(c) 6 m (d) 2 m

(SSC CGL Mains Exam 2016)

563. Four circles of equal radii are described about the four corners of a square so that each touches two of the other circles .If each side of the square is 140 cm then area of the space enclosed between the circumference of the circle is

(take π = 22/7)

(a) 4200 cm^2 (b) 2100 cm^2

(c) 7000 cm^2 (d) 2800 cm^2

(SSC CGL Mains Exam 2016)

564. The amount of concrete required to build a concrete cylindrical pillar whose base has a perimeter 8.8 metre and curved surface area 17.6 sq. metre. is (Take π = 22/7)

(a) 8.325 m^3 (b) 9.725 m^3

(c) 10.5 m^3 (d) 12.32 m^3

(SSC CGL Mains Exam 2016)

565. A hemispherical bowl of internal radius 9 cm, contains a liquid. This liquid is to be filled into small cylindrical bottles of diameter 3 cm and height 4 cm. Then the number of bottles necessary to empty the bowl is

(a) 18 (b) 45

(c) 27 (d) 54

(SSC CGL Mains Exam 2016)

566. A rectangular water tank is 80 m × 40 m. Water flows into it through a pipe of 40 sq. cm at the opening at a speed of 10km/hr. The water level will rise in the tank in half an hour is

(a) 3/2 cm (b) 4/9 cm
(c) 5/9 cm (d) 5/8 cm

(SSC CGL Mains Exam 2016)

567. A square and a regular hexagon are drawn such that all the vertices of the square and the hexagon are on a circle of radius r cm .The ratio of area of the square and the hexagon is

(a) 3 : 4 (b) $\sqrt{2}:\sqrt{3}$
(c) 4 : $3\sqrt{3}$ (d) 1 : $\sqrt{2}$

(SSC CGL Mains Exam 2016)

568. A solid cylinder has the total surface area 231 sq. cm. If its curved surface area is 2/3 of the surface area ,then the volume of the cylinder is

(a) 154 cu.cm (b) 308 cu.cm
(c) 269.5 cu.cm (d) 370 cu.cm

(SSC CGL Mains Exam 2016)

569. The lateral surface area of frustum of a right circular cone if the area of its base is 16π cm^2 and the diameter of circular upper surface is 4cm and slant height 6 cm, will be

(a) 30π cm^2 (b) 48π cm^2
(c) 36π cm^2 (d) 60π cm^2

(SSC CGL Mains Exam 2016)

570. The diameter of a sphere is twice the diameter of another sphere. The surface area of the first sphere is equal to the volume of the second sphere. The magnitude of the radius of the first sphere is

(a) 12 (b) 16
(c) 24 (d) 48

(SSC CGL Mains Exam 2016)

571. A right circular cylinder having diameter 21 cm & height 38 cm is full of ice cream. The ice cream is to be filled in cones of height 12 cm and diameter 7 cm having a hemispherical shape on the top. The number of such cones to be filled with ice cream is

(a) 54 (b) 36
(c) 44 (d) 24

(SSC CGL Mains Exam 2016)

572. Three cubes of iron whose edges are 6cm, 8cm and 10cm respectively are melted and formed into a single cube. The edge of the new cube formed is

(a) 12cm (b) 14cm
(c) 16cm (d) 18cm

(SSC CGL Mains Exam 2016)

573. The radii of two concentric circles are 68 cm and 22 cm. The area of the closed figure bounded by the boundaries of the circles is

(a) 4140π sq.cm.
(b) 4110π sq.cm.
(c) 4080π sq.cm.
(d) 4050π sq.cm.

(SSC CGL Mains Exam 2016)

574. The radius of a sphere is 6 cm. It is melted and drawn into a wire of radius 0.2 cm. The length of the wire is

(a) 81m (b) 80m
(c) 75m (d) 72m

(SSC CGL Mains Exam 2016)

575. In a trapezium ABCD, AB and DC are parallel sides and $\angle ADC = 90°$. If AB = 15 cm, CD = 40cm and diagonal AC = 41 cm. Then the area of the trapezium ABCD is

(a) 245 cm^2 (b) 240 cm^2
(c) 247.5 cm^2 (d) 250 cm^2

(SSC CGL Mains Exam 2016)

576. The area of a rhombus having one side 10 cm and one diagonal 12 cm is

(a) 48 cm^2 (b) 96 cm^2
(c) 144 cm^2 (d) 192 cm^2

(SSC CGL Mains Exam 2016)

577. The cost of levelling a circular field at 50 Paise per square metre is ₹ 7700. The cost (in Rs) of putting up a fence all round it at ₹ 1.20 per metre is (Use π = 22/7)

(a) ₹ 132 (b) ₹ 264
(c) ₹ 528 (d) ₹ 1056

(SSC CGL Mains Exam 2016)

578. From four corners of a rectangular sheet of dimensions 25 cm × 20 cm, square of side 2 cm is cut from four corners and a box is made. The volume of the box is

(a) 828 cm^3 (b) 672 cm^3
(c) 500 cm^3 (d) 1000 cm^3

(SSC CGL Mains Exam 2016)

579. The height and the total surface area of a right circular cylinder are 4 cm and 8π sq.cm. respectively. The radius of the base of cylinder is

(a) $\left(2\sqrt{2}-2\right)$ cm
(b) $\left(\sqrt{2}-2\right)$ cm
(c) 2 cm
(d) $\sqrt{2}$ cm

(SSC CGL Mains Exam 2016)

580. The whole surface area of a pyramid whose base is a regular polygon is 340 cm^2 and area of its base is 100 cm^2. Area of each lateral face is 30 cm^2.Then the number of lateral faces is

(a) 8 (b) 9
(c) 7 (d) 10

(SSC CGL Mains Exam 2016)

581. A sold brass sphere of radius 2.1 dm is converted into a right circular cylindrical rod of length 7 cm. The ratio of total surface areas of the rod to the sphere is

(a) 3 : 1 (b) 1 : 3
(c) 7 : 3 (d) 3 : 7

(SSC CGL Mains Exam 2016)

582. The sum of the length and breadth of a rectangle is 6 cm. A square is constructed such that one of its sides is equal to a diagonal of the rectangle. If the ratio of areas of the square and rectangle is 5 : 2, the area of the square in cm^2 is

(a) 20 (b) 10
(c) $4\sqrt{5}$ (d) $10\sqrt{2}$

(SSC CGL Mains Exam 2016)

583. The length of a side of an equilateral triangle is 8 cm. The area of the region lying between the circum circle and the incircle of the triangle is (use: π = 22/7)

(a) $50\frac{1}{7}$ cm^2 (b) $50\frac{2}{7}$ cm^2
(c) $75\frac{1}{7}$ cm^2 (d) $75\frac{2}{7}$ cm^2

(SSC CGL Mains Exam 2016)

584. A solid sphere of radius 3 cm is melted to form a hollow right circular cylindrical tube of length 4 cm and external radius 5 cm. The thickness of the tube is

(a) 1 cm (b) 9 cm

(c) 0.6 cm (d) 1.5 cm

(SSC CGL Mains Exam 2016)

585. If the sum of radius and height of a solid cylinder is 20 cm and its total surface area is 880 cm^2 then its volume is

(a) 1760 cm^3 (b) 8800 cm^3

(c) 2002 cm^3 (d) 4804 cm^3

(SSC CGL Mains Exam 2016)

586. The sides of a triangle are in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ and its perimeter is 104 cm, then find largest side of triangle

(a) 52 (b) 48

(c) 32 (d) 26

(SSC CGL Mains Exam 2016)

587. The four walls and celling of a room of length 25 m, breadth 12 m and height 10 m are to be painted. Painter A can paint 200 m^2 in 5 days, Painter B can paint 250 m^2 in 2 days. If A and B work together, they will finish the job in.

(a) 6 days (b) $6\frac{10}{33}$ days

(c) $7\frac{10}{33}$ days (d) 8 days

(SSC CGL Mains Exam 2016)

588. The base of a right prism is a trapezium whose length of parallel sides are 25 cm and 11 cm and the perpendicular distance between the parallel sides in 16 cm. If the height of the prism is 10 cm, then the volume of the prism is

(a) 1440 cu.cm (b) 1540 cu.cm

(c) 2880 cu.cm (d) 960 cu.cm

(SSC CGL Mains Exam 2016)

589. The external and the internal radii of a hollow right circular cylinder of height 15 cm are 6.75 cm and 5.25 cm respectively. If it is melted to form a solid cylinder of height half of the original cylinder, then the radius of the solid cylinder is

(a) 6 cm (b) 6.5 cm

(c) 7 cm (d) 7.25 cm

(SSC CGL Mains Exam 2016)

590. The length and breadth of a rectangular piece of a land are in a ratio 5 : 3. The owner spent ₹ 6000 for surrounding it from all sides at ₹ 7.50 per metre. The difference between its length and breadth is

(a) 50 metres (b) 100 metres

(c) 150 metres (d) 250 metres

(SSC CGL Mains Exam 2016)

591. A piece of wire 132 cm long is bent successively in the shape of an equilateral triangle, a square and a circle. Then area will be longest in shape of

(a) circle

(b) Equilateral triangle

(c) Square

(d) Equal in all the shapes

(SSC CGL Mains Exam 2016)

592. Two regular polygons are such that the ratio between their number of sides is 1 : 2 and the ratio of measures of their interior angles is 3 : 4. Then the number of sides of each polygon are

(a) 10, 20 (b) 4, 8

(c) 3, 6 (d) 5, 10

(SSC CGL Mains Exam 2016)

593. In an isosceles triangle, the length of each equal side is twice the length of the third side. The ratio of areas of the isosceles triangle and an equilateral triangle with same perimeter is

(a) $30\sqrt{5} : 100$ (b) $32\sqrt{5} : 100$

(c) $36\sqrt{5} : 100$ (d) $42\sqrt{5} : 100$

(SSC CGL Mains Exam 2016)

594. A right circular cylinder is partially filled with water. Two iron spherical balls are completely immersed in the water so that the height of the water in the cylinder rises by 4 cm. If the radius of one ball is half of the other and the diameter of the cylinder is 18 cm, then the radii of the spherical balls are

(a) 6cm and 12cm

(b) 4cm and 8cm

(c) 3cm and 6cm

(d) 2cm and 4cm

(SSC CGL Mains Exam 2016)

ANSWER KEY

1. (b)
2. (c)
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EXPLANATION

1. (b) Side of a square

$= \dfrac{\text{Diagonal}}{\sqrt{2}}$

Area of square

$= \dfrac{(\text{Diagonal})^2}{2} = \dfrac{(5.2)^2}{2} = \dfrac{5.2 \times 5.2}{2}$

$= 2.6 \times 5.2 =$ **13.52 cm²**

2. (c) Area of square

$= \dfrac{\text{Diagonal}^2}{2} = \dfrac{a^2}{2}$

3. (a) Let the length of rectangular hall = x

$\therefore$ Breadth of rectangular

hall $= \dfrac{3}{4}x$

According to question,

Area = 768 m²

$x \times \dfrac{3}{4}x = 768$

$\dfrac{3}{4}x^2 = 768$

$x^2 = \dfrac{768 \times 4}{3} = 256 \times 4$

$x = \sqrt{256 \times 4} = 32$ m.

Difference of length and

breadth $= x - \dfrac{3}{4}x = \dfrac{x}{4} = \dfrac{32}{4}$

= **8 m**

4. (c) Since the room is in cuboid shape

Length of largest rod = Diagonal of cuboid

$= \sqrt{l^2 + b^2 + h^2}$

$= \sqrt{16^2 + 12^2 + \dfrac{32^2}{3^2}}$

$= \sqrt{256 + 144 + \dfrac{1024}{9}}$

$= \sqrt{\dfrac{2304 + 1296 + 1024}{9}}$

$= \sqrt{\dfrac{4624}{9}} = \dfrac{68}{3} = 22\dfrac{2}{3}$ m

5. (b) Perimeter of square = 44cm

$4 \times$ side = 44

side = 11 cm

Area of square

$= (\text{side})^2 = (11)^2 = 121\text{cm}^2$

Circumference of circle

= 44cm

$2\pi(\text{radius}) = 44$

radius $= \dfrac{44 \times 7}{2 \times 22} = 7$ cm

area of circle

$= \dfrac{22}{7} \times 7 \times 7 = 154$ cm²

Option (b) is the answer. (circle, 33 cm²)

6. (b) Let the side of square = a

and the radius of circle = r

$\Rightarrow$ perimeter of square

= circumference of circle

$\Rightarrow 4a = 2\pi r$

$r = \dfrac{4a}{2\pi}$

area of circle = 3850 m²

$\pi \times \dfrac{4a}{2\pi} \times \dfrac{4a}{2\pi} = 3850$

$16a^2 = \dfrac{3850 \times 2 \times 2 \times 22}{7}$

$a^2 = 3025$ m²

7. (b) $2(l + b) = 28$

$l + b = 14$

and $l \times b = 48$

$(l + b)^2 = l^2 + b^2 + 2lb$

$(14)^2 = l^2 + b^2 + 48 \times 2$

$196 - 96 = l^2 + b^2$

$l^2 + b^2 = 100$

$\sqrt{l^2 + b^2} = 10$

Diagonal = 10 m = **10 cm**

8. (d) Side of the square

$= \dfrac{\text{Diagonal}}{\sqrt{2}} = \dfrac{4\sqrt{2}}{\sqrt{2}} = 4$

area of the square = 16

area of new square = 32

side of new square

$= \sqrt{32} = 4\sqrt{2}$

Diagonal of new square

$= 4\sqrt{2} \times \sqrt{2} = 8$ cm

9. (d) Diagonal of square **(A)**

A = (a + b)

side of square

$= \dfrac{\text{Diagonal}}{\sqrt{2}} = \dfrac{a + b}{\sqrt{2}}$

area of square

$A = \left(\dfrac{a + b}{\sqrt{2}}\right)^2$

$= \dfrac{(a + b)^2}{2}$

area of square

B = 2 × area of square

$A = 2 \times \dfrac{(a + b)^2}{2} = (a + b)^2$

side of square

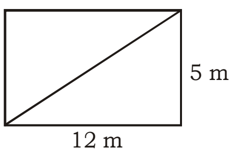
$B = \sqrt{(a+b)^2}$

$= (a + b)$

diagonal of square

$B = \sqrt{2}(a + b)$

10. (a)



area of the rectangular garden

$= 12 \times 5 = 60$ m²

$\therefore$ area of square = 60

$(\text{side})^2 = 60$

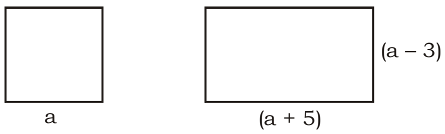
side $= \sqrt{60}$

diagonal of the square

$= \sqrt{2}$ side

$= \sqrt{2} \times \sqrt{60} = \sqrt{120} = 2\sqrt{30}$ m

11. **(d)**



According to question,

$a^2 = (a - 3)(a + 5)$

$a^2 = a^2 + 5a - 3a - 15$

$2a = 15$

$a = \frac{15}{2}$

Length $= a + 5 = \frac{15}{2} + 5$

$= \frac{25}{2}$

breadth $= a - 3 = \frac{15}{2} - 3$

$= \frac{15 - 6}{2} = \frac{9}{2}$

perimeter of the rectangle

$= 2(l + b) = 2\left(\frac{25}{2} + \frac{9}{2}\right) = 34$ cm

12. **(a)** According to question,

$2(l + b) = 160$

$l + b = 80$ .....(i)

$l - b = 48$ ....(ii)

On solving (i) and (ii)

$l = 64$, $b = 16$

$\Rightarrow$ area of square

= area of rectangle

$\Rightarrow (\text{side})^2 = 64 \times 16$

$\Rightarrow$ side $= \sqrt{64 \times 16} = 32$ m

13. **(b)** Side of square, whose perimeter is 24 cm

$= \frac{24}{4} = 6$cm

So, area of square $= 6^2$

$= 36$ cm²

Again, side of square, whose perimeter is 32 cm

$= \frac{32}{4} = 8$ cm

So, area of this square

$= 8^2 = 64$ cm²

According to question,

Area of new square

$= 64 + 36 = 100$ cm²

$\therefore$ side of the new square

$= \sqrt{100} = 10$ cm

Hence perimeter of new square

$= 10 \times 4 = 40$ cm

14. **(d)** $(\text{side})^2 = 484$ cm²

side $= 22$ cm

perimeter of square

$= 4 \times 22 = 88$ cm

According to question, $2\pi r$

$= 88$ cm

$r = \frac{88 \times 7}{2 \times 22} = 14$ cm

area of circle $= \pi r^2$

$= \frac{22}{7} \times 14 \times 14 =$ **616 cm²**

15. **(b)** Let the length of smaller line segment $= x$ cm

The length of larger line segment $= (x + 2)$ cm

According to question,

$(x + 2)^2 - x^2 = 32$

$x^2 + 4x + 4 - x^2 = 32$

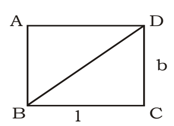
$x = \frac{28}{4} = 7$

The required length

$= x + 2$

$= 7 + 2 = 9$ cm

16. **(d)**



BD = length of diagonal

= speed × time

$= \frac{52}{60} \times 15 = 13$ m

$BD = \sqrt{l^2 + b^2}$

$\Rightarrow l^2 + b^2 = 13^2 = 169$

Again, $l + b = \frac{68}{60} \times 15 = 17$

$(l + b) = l^2 + b^2 + 2lb$

$17^2 = 169 + 2lb$

$lb = \frac{120}{2} =$ **60 m²**

17. **(d)** Let the breadth be

$= x$ m

$\therefore$ length $= (23 + x)$ m

$\Rightarrow 2(x + 23 + x) = 206$

$4x = 206 - 46$

$x = \frac{160}{4} = 40$ m

$\therefore$ length $= 40 + 23 = 63$ m

$\therefore$ Required area

$= 63 \times 40$

$= 2520$ m²

18. **(b)** Length of rectangle = 48 m

Breadth of rectangle =16 m

According to question,

Perimeter of square

= Perimeter of rectangle

$4 \times \text{side} = 2(48 + 16) = 2 \times 64$

side $= \frac{2 \times 64}{4} = 32$ m

$\therefore$ Area of the square

$= (\text{side})^2 = (32)^2 = 1024$

19. **(c)** side of the square

$= \frac{\textit{perimeter}}{4}$

$\therefore$ Sides of all five squares are

$= \frac{24}{4}, \frac{32}{4}, \frac{40}{4}, \frac{76}{4}, \frac{80}{4}$

= 6, 8, 10, 19, 20

ATQ

Area of another square

$= 6^2 + 8^2 + 10^2 + 19^2 + 20^2$

$(\text{side})^2 = 36 + 64 + 100 + 361 + 400$

side $= \sqrt{961} = 31$

Perimeter of new square = 4 × side = 4 × 31 = 124

20. **(c)** Area of the tank

= length × breadth

= 180 × 120 = 21600 m²

Total area of the circular plot

= 40000 + 21600=61600 m²

$\therefore$ area of circle = 61600

$\pi(\text{radius})^2 = 61600$

$(\text{radius})^2 = \frac{61600 \times 7}{22}$

radius $= \sqrt{2800 \times 7}$

$= \sqrt{7 \times 7 \times 400}$

$= 7 \times 20 = 140$m

21. (d) Let the breadth of rectangle $= x$ m

$\therefore$ length $= (x + 5)$ m

$\therefore$ Area of hall

$=$ length $\times$ breath

$= (x + 5)x$

$= 750 = 30 \times 25$

(clearly $750 = 30 \times 25$)

$\therefore$ $x = 25$, breadth $= 25$m

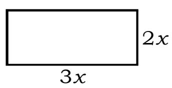
length $= 25 + 5 =$ **30 m**

22. (d) Required total area

$=$ area of four walls $+$ area of base

$= 2 \times 1.25(6 + 4) + 6 \times 4 = 49\ m^2$

23. (a)



Ratio of length and breadth

$= 3 : 2$

$2(l + b) = 20$ cm

$2(3x + 2x) = 20$ cm

$2 \times 5x = 20$ cm

$10x = 20$

$x = 2$

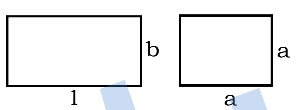
$\therefore$ length $= 3 \times 2 = 6$ cm,

breadth $= 2 \times 2 = 4$ cm

area $=$ length $\times$ breadth

$= 6 \times 4 = 24\ cm^2$

24. (d)



$2(l + b) = 160$m $\quad 4a = 160$

$l + b = 80$m ....(i)

$a = 40$ m

ATQ $a^2 - lb = 100$

$(40)^2 - lb = 100$

$1600 - lb = 100$

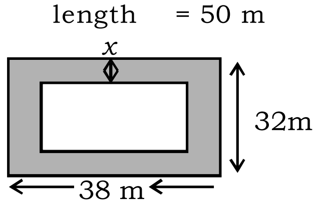
$lb = 1500$ .....(ii)

Clearly, $50 + 30 = 80$

and $50 \times 30 = 1500$

length $= 50$ m

25. (b)



area of path $= 600\ m^2$

$(l + b - 2x)\ 2x = 600$

$(38 + 32 - 2x)2x = 600$

$(70 - 2x)2x = 600$

$(70 - 2x)x = \frac{600}{2} = 300$

$70x - 2x^2 = 300$

$2x^2 - 70x + 300 = 0$

$x^2 - 35x + 150 = 0$

$x^2 - 30x - 5x + 150 = 0$

$x(x - 30) - 5(x - 30) = 0$

$(x - 30)(x - 5) = 0$

$x = 30$ not possible

$x = 5$ (right)

Alternate:-

area of path $= (l + b - 2x)2x = 600$

take help from options to save your valuable time take option(b) $x = 5$m

$(38 + 32 - 2 \times 5)\ 2 \times 5$

$= (70 - 10) \times 10 = 60 \times 10 = 600$

26. (c) Area of walls

$=$ Perimeter of base $\times$ height

$= 18 \times 3 = 54\ m^2$

27. (d) $a^2 = 81$, $a = 9$

$\Rightarrow$ Perimeter of square

$= 9 \times 4 = 36$ cm

$\Rightarrow 2r + \pi r = 36$

$r(2 + \pi) = 36$

$r = \frac{36}{2 + \frac{22}{7}} = 7$ cm

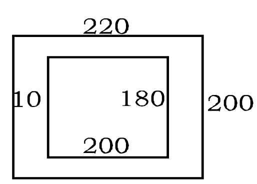
28. (d) Let the no. of hours be x

$\Rightarrow (0.3 \times 0.2 \times 20000) \times x$

$= 200 \times 150 \times 8$

$\Rightarrow x = \frac{200 \times 150 \times 8}{3 \times 2 \times 200} = 200$ hrs.

29. (a)



Area of path

$= 200 \times 220 - 200 \times 180$

$= 44000 - 36000 = 8000\ m^2$

30. (c) Diagonal of square

$=$ diameter of circle

$= 8 \times 2 = 16$ cm

$\therefore$ side of square $= \frac{16}{\sqrt{2}} = 8\sqrt{2}$ cm

$\Rightarrow$ area of square $= \left(8\sqrt{2}\right)^2$

$= 128\ cm^2$

31. (a) Side of square $= \frac{8\sqrt{2}}{\sqrt{2}} = 8$ cm

$\therefore$ Area of square $= 8 \times 8$

$= 64\ cm^2$

32. (a) $x^2 + 7x + 10 = x^2 + 5x + 2x + 10$

$= x(x + 5) + 2(x + 5)$

$= (x + 2)(x + 5)$

$\therefore$ Two sides of rectangle

$= (x + 2)(x + 5)$

$\therefore$ Perimeter $= 2(x + 2 + x + 5)$

$= 2(2x + 7) = 4x + 14$

33. (c) Let the sides of rectangle be 6 cm and 2 cm (or any other number)

$\Rightarrow$ Area of rectangle (Q) $= 6 \times 2$

$= 12\ cm^2$

$\therefore$ Side of square $= 4$ cm

$\Rightarrow$ Area of square(P)$= 4 \times 4$

$= 16\ cm^2$

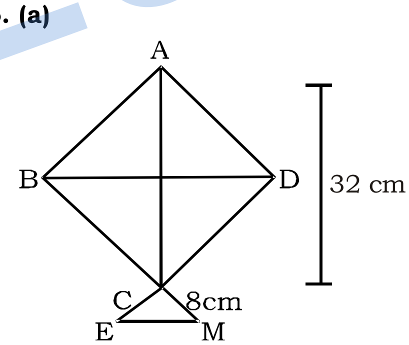
$\Rightarrow P > Q$

34. (b) No. of cubes with no side painted $= (n-2)^3$

Where n is the side of the bigger cube

Required number $= (6-2)^3 = 64$

35. (a)



Area of square

$= \frac{1}{2}$ (Diagonal)^2 $= \frac{1}{2}(32)^2$

$= \frac{1}{2} \times 32 \times 32 = 16 \times 32$

$= 512\ cm^2$

Area of triangle $=$

$\frac{\sqrt{3}}{4}(8)^2 = \frac{1.732 \times 8 \times 8}{4}$

$= 1.732 \times 2 \times 8 = 27.712\ cm^2$

Required area

$= (512 + 27.712) cm^2$

$=$ **539.712 cm²**

36. (a) Area of the lawn

$= \frac{1}{12}$ hectare

length × breadth $= \frac{1}{12} \times 10000 m^2$

$4x \times 3x = \frac{10000}{12} m^2$

$12x^2 = \frac{10000}{12}$

$x^2 = \frac{10000}{12 \times 12}$

$x = \frac{100}{12}$

Breadth = 3x = $3 \times \frac{100}{12}$

$= \frac{100}{4}$ = **25 m**

37. (a) Let the side of square = a cm

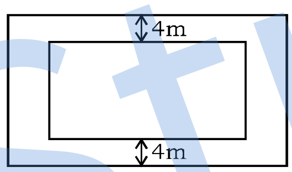
ATQ

$l \times b = 3a^2$

$20 \times \frac{3}{2}a = 3a^2$

a = **10 cm**

38. (d)



Area of path $= (l + b + 2x)2x$

∴ where x = thickness of path

Let l = 7p , b = 4p

{7p + 4p + 2(4)}2(4) = 416

(11p + 8)8 = 416

11p + 8 = 52

11p = 44

$p = \frac{44}{11} = 4$, p = 4

∴ breadth = 4 × 4 = **16 m**

39. (d) Area of the floor= 8 × 6 = 48 m^2

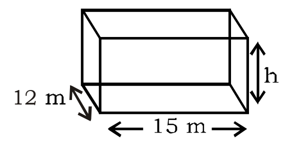
= 4800 dm^2 (1m =10 dm)

Area of square tile

= 4 × 4 = 16 dm^2

No. of tiles $= \frac{4800}{16}$ = **300**

40. (b)



Shape of godown is cuboidal

(l) length = 15 m ,

breadth = 12 m height = h m

Area of four walls = $2(l + b) \times h$

area of floor = $l \times b$

area of ceiling = $l \times b$

ATQ $l \times b + l \times b = 2(l + b) \times h$

$2(l \times b) = 2(l + b) \times h$

2(15 × 12) = 2(15+12)× h

= 2 × 27 × h

2 × 180 = 2 × 27 × h

$h = \frac{180}{27} = \mathbf{\frac{20}{3}\ m}$

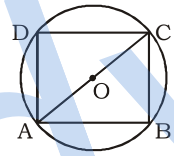
Volume of the cuboid

= l × b × h

$= 15 \times 12 \times \frac{20}{3}$

= 60 × 20 = **1200 m³**

41. (a)



Side of a square = AB

$= \sqrt{2}$ a units

∴ AC = Diagonal

$= \sqrt{2} \times \sqrt{2}$ a

∴ Diameter = 2 a units

Circumference

= π × diameter

= π × 2a = 2πa units.

42. (b) Perimeter of rectangle = 40m

Length = 12 metre

∴ 2(l + b) = 40

2 (12 + b) = 40

$12 + b = \frac{40}{2} = 20$

b = 20 – 12 = **8 m**

43. (d) Percentage increase in area

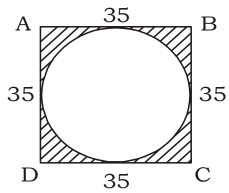
$= \left(x + y + \frac{xy}{100}\right)\%$

Here, x = 100%, y = 100%

$= \left(100 + 100 + \frac{100 \times 100}{100}\right)\%$

= **300%**

44.(b)



According to the question,

Radius of circle $= \frac{35}{2}$

Required area of shaded portion $= (35)^2 - \frac{22}{7} \times \frac{35}{2} \times \frac{35}{2}$

= 1225 – 962.5 = 262.5 cm^2

45. (b) Diagonal of square = $\sqrt{2}$ side of square

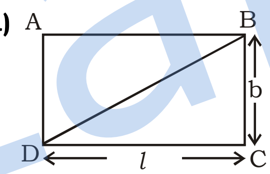
Here a = $\frac{1}{2}(x + 1)$ and d = $\frac{3 - x}{\sqrt{2}}$

∵ d = $\sqrt{2}a$

$\Rightarrow \frac{3 - x}{\sqrt{2}} = \sqrt{2}\left[\frac{1}{2}(x + 1)\right]$

∵ x = 1 unit

46. (a)



Let ABCD is a rectangular carpet having length l metre and breadth b metre and BD is a diagonal

⇒ As we know

→ Area

⇒ $l \times b = 120$ ....(i)

→ Perimeter

⇒ $2(l + b) = 46$

Using formula

⇒ $(l + b)^2 = l^2 + b^2 + 2lb$

⇒ $(23)^2 = l^2 + b^2 + 2 \times 120$

⇒ $529 = l^2 + b^2 + 240$

⇒ $l^2 + b^2 = 529 - 240$

⇒ $l^2 + b^2 = 289$

⇒ $\sqrt{l^2 + b^2} = \sqrt{289}$

diagonal = 17

diagonal of carpet is17 metres

47. (c) Let the breadth of floor = x m

Then the length of floor

= $(x+3)$ m

A.T.Q.

$x \times (x + 3) = 70$

$x^2 + 3x - 70 = 0$

$x^2 + 10x - 7x - 70 = 0$

$(x + 10)(x - 7) = 0$

$x = 7, x = -10$

Breadth = 7m

Length = 10m

Perimeter of floor = 2 (L + B)

= 2 (10 + 7) = 34 m

48. (b) Radius of circle = 5 cm

Length of arc,

$l = 3.5$ cm

$\therefore$ Area of sector $= \frac{1}{2} lr$

$\frac{1}{2} \times 3.5 \times 5 =$ **8.75 cm²**

49. (c) Radius of circular wheel

= 1.75 m

Circumference of circular

wheel $= 2\pi r = 2 \times \frac{22}{7} \times 1.75$ m

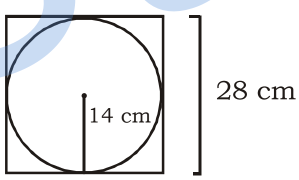
No. of revolutions

$= \frac{\text{Distance to be covered}}{\text{Circumference of circle}}$

$= \frac{11000\text{m}}{2 \times \frac{22}{7} \times 1.75 \text{ m}} = \frac{11000}{11}$

= **1000**

50. (d)



Radius of the largest circle

$= \frac{1}{2} \times$ side of square

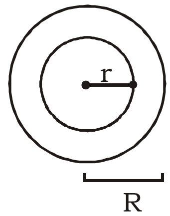
$= \frac{1}{2} \times 28 = 14$ cm

area of the circle

$= \pi(\text{radius})^2$

$= \frac{22}{7} \times 14 \times 14 = 616 \text{ cm}^2$

51. (b)



$\because \quad 2\pi r = 88$

$r = \frac{88 \times 7}{2 \times 22} = 14\text{cm}$

$2\pi R = 132$ cm

$R = \frac{132 \times 7}{2 \times 22} = 21$ cm

The area between two circles

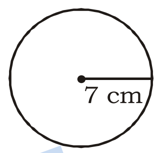
$= \pi(21)^2 - \pi(14)^2$

$= \pi\{21^2 - 14^2\}$

$= \pi\ (21+14)(21-14)$

$= \frac{22}{7} \times 35 \times 7 = 770 \text{ cm}^2$

52. (b)



circumference of wheel

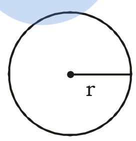
$= 2\pi r$

$= 2 \times \frac{22}{7} \times 7 = 44\text{cm}$

$\therefore$ Total distance travelled by wheel in 15 revolutions

= 15 × 44 cm = **660 cm**

53. (c)



Circumference $= 2\pi r$

Distance covered in 1 min

$= 2 \times \frac{8}{40} \times \pi r$

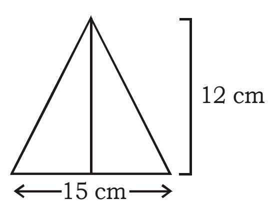
New circumference

$= 2 \times \pi \times r \times 10$

Time taken $= \frac{2\pi r \times 10 \times 40}{2\pi r \times 8}$

= 50 min

54. (b)



area of the triangle

$= \frac{1}{2} \times$ base × height

$= \frac{1}{2} \times 15 \times 12 = 90 \text{ cm}^2$

area of another triangle

$= 2 \times 90 = 180 \text{ cm}^2$

$\frac{1}{2} \times$ base × height = 180

$\frac{1}{2} \times 20 \times \text{height} = 180$

$\text{height} = \frac{180 \times 2}{20} = 18$ cm

55. (b) Area of square

$= (12)^2 = 144 \text{ cm}^2$

Area of triangle

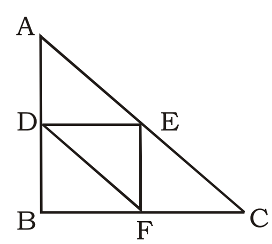
$= \frac{1}{2} \times$ base × height

$= \frac{1}{2} \times 12 \times$ height

$= \frac{1}{2} \times 12 \times \text{height} = 144$

$\text{height} = \frac{144 \times 2}{12} = 24\text{cm}$

56. (c)



$\because 3^2 + 4^2 = 5^2$

Δ ABC is a right angled triangle

area of (ΔABC)

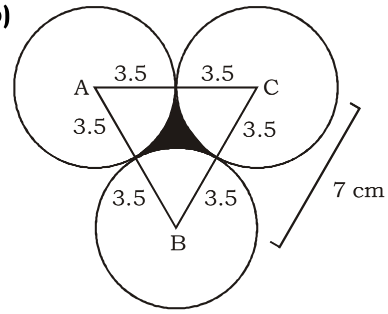
$= \frac{1}{2} \times AB \times BC$

$= \frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$

$\therefore$ Required Area of

$(\Delta DEF) = \frac{1}{4} \times 6 = \frac{3}{2} \text{ cm}^2$

57.(b)



AB = BC = AC = 7 cm

Area enclosed

= Area of equilateral Δ ABC – $\frac{1}{2}$(area of 1 circle)

$= \frac{\sqrt{3}}{4}\times(7)^2 - \frac{1}{2}\left[\frac{22}{7}\times(3.5)^2\right]$

= 1.967 cm²

58. (b) Required area =Area of square – Area of one circle

$= (2a)^2 - \pi (a)^2$

$= 4a^2 - \frac{22}{7}a^2$

$= \frac{28a^2 - 22a^2}{7} = \frac{6a^2}{7}$

59. (c) Diameter of the circle = Side of square

2 r = 21

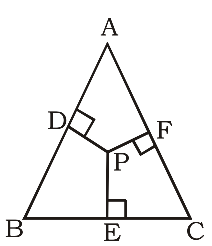
$r = \frac{21}{2}$ m

Area = $\pi r^2 = \pi\left(\frac{21}{2}\right)^2$

$= \frac{22}{7}\times\frac{21}{2}\times\frac{21}{2} = \frac{693}{2}$ cm²

$= 346\frac{1}{2}$ cm²

60. (c)



Let P be the point inside the equilateral Δ ABC

Let, PD= $\sqrt{3}$, PE = $2\sqrt{3}$,

PF = $5\sqrt{3}$

and AB = BC = AC = x

ar.ΔABC = ar.ΔABP + ar.ΔACP + ar.ΔBCP

$= \frac{1}{2}\times x\times\sqrt{3} + \frac{1}{2}\times x\times 2\sqrt{3} + \frac{1}{2}\times x\times 5\sqrt{3}$

$\frac{\sqrt{3}}{4}x^2 = \frac{1}{2}\times x\times\sqrt{3} + \frac{1}{2}\times x\times 2\sqrt{3} + \frac{1}{2}\times x\times 5\sqrt{3}$

$\sqrt{3}x = 2\sqrt{3} + 4\sqrt{3} + 10\sqrt{3}$

$x = 16$

∴ perimeter of triangle

$= 3x = 3\times 16 = 48$ cm

Alternative:-

side of equilateral Δ = $\frac{2}{\sqrt{3}}$(sum of the altitudes drawn from internal point)

side = $\frac{2}{\sqrt{3}}\left(\sqrt{3} + 2\sqrt{3} + 5\sqrt{3}\right)$

$= \frac{2}{\sqrt{3}}\times 8\sqrt{3} = 16$ cm

perimeter = 3 × side

= 3 × 16 = 48 cm

61. (c) Perimeter of Δ = 30 cm

Area = 30 cm²

Check the triplet

$\{(5, 12, 13), (3, 4, 5)\}$

whose largest side is 13.

Also, $5^2 + 12^2 = 13^2$

And perimeter

= 5 + 12 + 13 = 30 cm

Smallest side = 5 cm

62. (b) distance covered = 2 km 26 decameters

= (2 × 1000 + 26 ×10)

(1 decameter = 10 meter)

= 2260 m

Distance covered in 1 revolution

$= \frac{\text{Total distance}}{\text{Number of revolutions}} = \frac{2260}{113}$

= 20 m

Now, π× diameter = 20

diameter $= \frac{20\times 7}{22}$

$= \frac{70}{11} = 6\frac{4}{11}$ m

63. (c) Let outer Radius = R and inner Radius = r

$2\pi R - 2\pi r = 132$

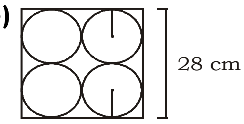
$2\pi(R - r) = 132$

$R - r = \frac{132\times 7}{2\times 22} = 21$

Hence, width of path

= **21 metres.**

64. (b)



side of square papersheet

$= \sqrt{784} = 28$ cm

Radius of each circle

$= \frac{28}{4} = 7$ cm

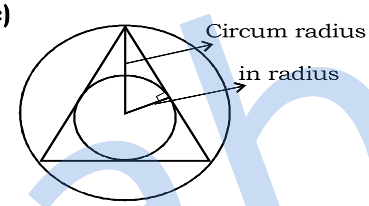
∴ circumference of each circular plate

$= 2\pi r$

$= 2\times\frac{22}{7}\times 7$

= **44 cm**

65. (c)



Circum radius of equilateral triangle $= \frac{(side)}{\sqrt{3}}$ $\frac{side}{\sqrt{3}} = 8$

side = $8\sqrt{3}$

∴ In radius of equilateral triangle $= \frac{(side)}{2\sqrt{3}}$

$= \frac{8\sqrt{3}}{2\sqrt{3}} = 4$ cm

66. (b) Radius of each circle = 1cm with all the three centres an equilateral triangle of side 2 cm is formed .

Area enclosed by coins

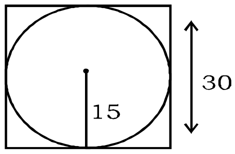
= (area of equilateral triangle) – 3× (area of sector of angle 60°)

$= \frac{\sqrt{3}}{4}(2)^2 - 3\times\frac{60}{360}\times\pi(1)^2$

$= \frac{\sqrt{3}}{4}\times 4 - 3\times\frac{1}{6}\times\pi$

$= \left(\sqrt{3} - \frac{\pi}{2}\right)$ cm²

67. (a)



Side of the square

$= \frac{\text{Perimeter}}{4} = \frac{120}{4} = 30$ cm

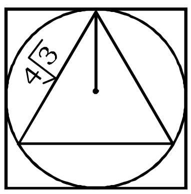
Radius of the circle

$= \frac{\text{side}}{2} = \frac{30}{2} = 15$ cm

Area of the circle

$= \frac{22}{7} \times (\text{radius})^2 = \frac{22}{7} \times (15)^2$

68. (c)



Side of equilateral triangle $= 4\sqrt{3}$

Circumradius of triangle

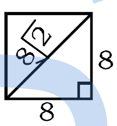
$= \frac{\text{side}}{\sqrt{3}} = \frac{4\sqrt{3}}{\sqrt{3}} = 4$

See the figure

Side of square

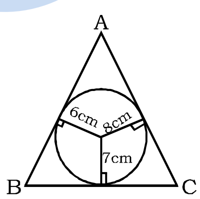
= 2 × circum radius

= 2 × 4 = 8



Diagonal of square $= 8\sqrt{2}$ cm²

69. (c)



length of side $= \frac{2}{\sqrt{3}}(P_1 + P_2 + P_3)$

$= \frac{2}{\sqrt{3}}(6 + 7 + 8) = \frac{2}{\sqrt{3}} \times 21$

$= \frac{42}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{42\sqrt{3}}{3} = 14\sqrt{3}$ cm

70. (c) Remember : area of isosceles triangle

$= \frac{1}{2}a^2 \sin\theta$

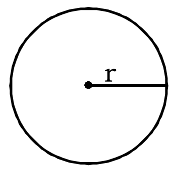
(θ is angle between equal sides)

$= \frac{1}{2}(10)^2 \times \sin 45°$

$= \frac{100}{2} \times \frac{1}{\sqrt{2}} = \frac{50}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$= 25\sqrt{2}$ cm²

71. (b)



Circumference – diameter

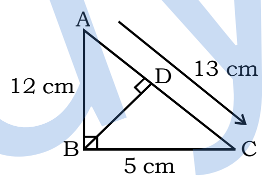
= 30 cm

$2\pi r - 2r = 30$

$2r(\pi - 1) = 30$

$r = \frac{30}{2\left(\frac{22}{7} - 1\right)} = \frac{30 \times 7}{2 \times 15} = 7$ cm

72. (b)



$AC = \sqrt{12^2 + 5^2} = \sqrt{144 + 25}$

$= \sqrt{169} = 13$ cm

length of perpendicular,

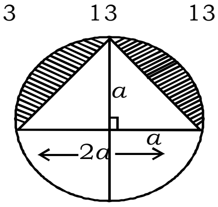
$BD = \frac{AB \times BC}{AC}$

∴ Length of perpendicular to hypotenuse

$= \frac{\text{perpendicular} \times \text{Base}}{\text{Hypotenuse}}$

$= \frac{12 \times 5}{13} = \frac{60}{13} = 4\frac{8}{13}$ cm

73. (c)



area of shaded region = area of semi-circle – area of triangle

$= \frac{\pi(a)^2}{2} - \frac{1}{2} \times a \times 2a$

$= \frac{\pi a^2}{2} - a^2 = a^2\left(\frac{\pi}{2} - 1\right)$ sq units

74. (c) According to question

$\pi(R + 1)^2 - \pi R^2 = 22$

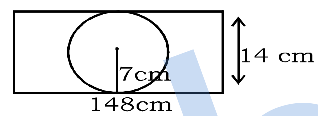
$\pi\{(R+1)^2 - R^2\} = 22$

$(R + 1 + R)(R + 1 - R) = \frac{22 \times 7}{22} = 7$

$2R + 1 = 7$

$R = 3$ cm

75. (b)

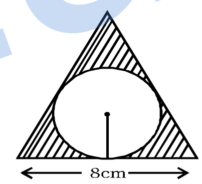


Radius of largest circle

$= \frac{\text{breadth}}{2} = \frac{14}{2} = 7$ cm

Area $= \frac{22}{7} \times 7 \times 7 = 154$ cm²

76. (b)



In radius of circle (r) $= \frac{\text{side}}{2\sqrt{3}}$

$= \frac{8}{2\sqrt{3}} = \frac{4}{\sqrt{3}}$

Area of circle

$= \pi\left(\frac{4}{\sqrt{3}}\right)^2 = \frac{22}{7} \times \frac{4 \times 4}{3}$

$= \frac{22 \times 16}{21} = 16.76$

Required area

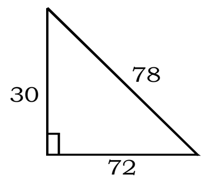
$= \frac{\sqrt{3}}{4}(8)^2 - \frac{22 \times 16}{21}$

$= \frac{\sqrt{3}}{4} \times 64 - 16.76 = 16\sqrt{3} - 16.76$

$= 27.71 - 16.76 = 10.95$ cm²

77. (c) 30 : 72 : 78
5 : 12 : 13

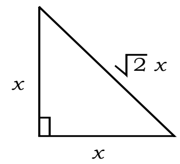
So, the triangle is right angle triangle



$\frac{1}{2} \times 30 \times 72 = \frac{1}{2} \times$ altitude $\times 72$

altitude = 30 m

78. (a)



Perimeter of triangle

$= 4\sqrt{2} + 4$

$x + x + \sqrt{2}\,x = 4\sqrt{2} + 4$

$2x + \sqrt{2}\,x = 4\sqrt{2} + 4$

$x\left(2 + \sqrt{2}\right) = 4\left(\sqrt{2} + 1\right)$

$x = \frac{4}{\sqrt{2}}$

Hypotenuse $= \sqrt{2}x$

$= \sqrt{2} \times \frac{4}{\sqrt{2}} = 4$ cm

79. (a) $2\pi r = 11$

$\Rightarrow r = \frac{11 \times 7}{22 \times 2} = \frac{7}{4}$

Area of sector

$= \frac{\theta}{360} \times \pi r^2$

$= \frac{60}{360} \times \frac{22}{7} \times \frac{7}{4} \times \frac{7}{4}$

$= \frac{77}{48} = 1\frac{29}{48}$ cm²

80. (c) Let the side of the triangle be 'a' cm

$\Rightarrow$ Circumradius $= \frac{a}{\sqrt{3}}$

and Inradius $= \frac{a}{2\sqrt{3}}$

$\Rightarrow \pi\left(\frac{a}{\sqrt{3}}\right)^2 - \pi\left(\frac{a}{2\sqrt{3}}\right)^2 = 44$

$\Rightarrow \pi\left(\frac{a^2}{3} - \frac{a^2}{12}\right) = 44$

$\Rightarrow \frac{4a^2 - a^2}{12} = \frac{44 \times 7}{22} = 14$

$\Rightarrow \frac{3a^2}{12} = 14$

$\Rightarrow a^2 = 56$

$\Rightarrow a = 2\sqrt{14}$

$\Rightarrow$ area $= \frac{\sqrt{3}}{4} \times 2\sqrt{14} \times 2\sqrt{14}$

$= 14\sqrt{3}$ cm²

81. (c) Side of square = diameter of the circle

$\pi r^2 = 9\pi$

$\Rightarrow r = 3$ cm

$\Rightarrow$ Side of square $= 3 \times 2 = 6$ cm

$\Rightarrow$ Area $= 6 \times 6 = 36$ cm²

82. (d) The given triangle is a right angled triangle

$\Rightarrow$ side of the square

$= \frac{P \times b}{P + b} = \frac{8 \times 6}{8 + 6} = \frac{24}{7}$

$\Rightarrow$ Area of square

$= \left(\frac{24}{7}\right)^2 = \frac{576}{49}$ cm²

83. (b) Radius of circumcircle

$= \frac{8}{\sqrt{3}}$ cm

Radius of incircle

$= \frac{8}{2\sqrt{3}} = \frac{4}{\sqrt{3}}$ cm

$\Rightarrow$ Required area $= \pi(R^2 - r^2)$

$= \frac{22}{7}\left(\left(\frac{8}{\sqrt{3}}\right)^2 - \left(\frac{4}{\sqrt{3}}\right)^2\right)$

$= \frac{22}{7}\left(\frac{64}{3} - \frac{16}{3}\right)$

$= \frac{22}{7} \times 16 = 50\frac{2}{7}$ cm²

84. (c) $2r + \pi r = \frac{1}{2}\pi r^2$

$\Rightarrow r(2 + \pi) = \frac{1}{2}\pi r^2$

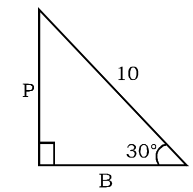
$\Rightarrow 4 + 2\pi = \pi r$

$\Rightarrow r = \frac{4}{\pi} + 2$

$\Rightarrow$ Diameter $= 2\left(\frac{4}{\pi} + 2\right)$

$= 6\frac{6}{11}$ m

85. (a) The angles of the given triangle are 90°,30° and 60°



$P = \frac{10}{2} = 5$

$B = 5\sqrt{3}$

$\Rightarrow$ Area $= \frac{1}{2} \times 5\sqrt{3} \times 5$

$= \frac{25\sqrt{3}}{2}$ cm²

86. (c) Let the altitude $= x$ cm

$\Rightarrow \frac{1}{2} \times x \times 8 = \pi \times 8^2$

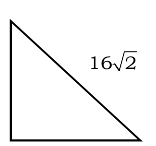
$\Rightarrow x = \frac{\pi \times 64}{4}$

$\Rightarrow x = 16\pi$

87. (d) The sides of the given triangle are 3,4 and 5 cm

area $= \frac{1}{2} \times 3 \times 4 = 6$ cm²

88. (b)



Other sides $= \frac{16\sqrt{2}}{\sqrt{2}} = 16$ cm

(as the Δ isosceles)

$\Rightarrow$ Area $= \frac{1}{2} \times 16 \times 16$

= 128 cm²

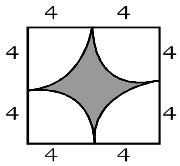
89. (a) The radius of park = $\frac{176}{2\pi}$

= 28 m

$\Rightarrow$ Area of road = $\pi(28 + 7)^2 - \pi(28)^2 = \pi(35 + 28)(35 - 28)$

$= \frac{22}{7} \times 7 \times 63 = 1386\ m^2$

90. (b)



Area of shaded portion

$= 8 \times 8 - \pi \times 4^2$

$= 64 - 16\pi$

$= 16(4 - \pi)\ cm^2$

91. (c) Radius of incircle

$= \frac{14\sqrt{3}}{2\sqrt{3}} = 7$ cm

$\Rightarrow$ Area = $\pi r^2 = \frac{22}{7} \times 7 \times 7$

= 154 cm ^{2}

92. (c) $\frac{\sqrt{3}}{4} a^2 = 121\sqrt{3}$

$\Rightarrow$ a = 22 cm

$\Rightarrow$ 3a = 66 cm

Circumference of circle = 66 cm

$2\pi r = 66$

$r = \frac{66 \times 7}{2 \times 22} = \frac{21}{2}$

Area = $\pi r^2 = \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$

$= 346.5\ cm^2$

93.(b) Area grazed by the cow

$= \frac{1}{2}\pi r^2$

$= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 = 77\ m^2$

$S = \frac{26 + 30 + 28}{2} = 42$

Area of field

$= \sqrt{s(s-a)(s-b)(s-c)}$

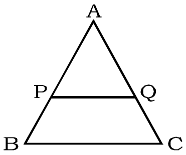
$= \sqrt{42 \times 16 \times 14 \times 12}$

$= 336\ m^2$

$\Rightarrow$ Remaining area

$= 336 - 77 = 259\ m^2$

94. (c)



As PQ||BC

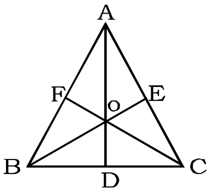
$\Rightarrow \triangle APQ \sim \triangle ABC$

$\Rightarrow \triangle APQ$ is also an equilateral $\triangle$

$\Rightarrow \triangle APQ = \frac{\sqrt{3}}{4}(5)^2$

$= \frac{25\sqrt{3}}{4}\ cm^2$

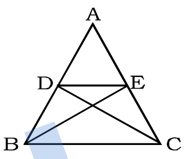
95. (b)



ar $\triangle$ AOE = 15 cm²

ar $\square$ BDOF = 2 × ar $\triangle$ AOE = 30 cm²

96. (b)



ar. $\triangle$ ADE + ar. $\triangle$ DEC

= ar. $\triangle$ ADE + ar $\triangle$ DEB

ar. $\triangle$ ABE = ar $\triangle$ ACD = 36 cm²

Note: ar. $\triangle$ DEC तथा ar $\triangle$ DEB become on same base and same height

97. (a) The third side will be either 15 or 22

$\Rightarrow$ Possible perimeter

= 15 × 2 +22 = 52

and 22 × 2 + 15 = 59

98. (b) $2\pi r = \frac{440}{1000}$

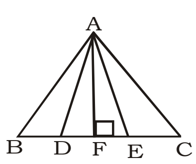
$\Rightarrow r = \frac{22 \times 7}{50 \times 22 \times 2} = .07$

$\Rightarrow$ Diameter = .14 m

99. (b) Length of rubber band

$= 3d + 2\pi r = 30 + 10\pi$

100. (c)



In triangle AFB AF $\perp$ BC

$AF^2 = AB^2 - FB^2 = 100 - 25$

$AF = 5\sqrt{3}$

In triangle ADF

$AD^2 = AF^2 + DF^2$

$AD^2 = 75 + \left(5 - \frac{10}{3}\right)^2$

$AD = \frac{10\sqrt{7}}{3}$

101. (c) Let sides of triangle are , a,b and c respectively

$\therefore$ largest side given =17 cm

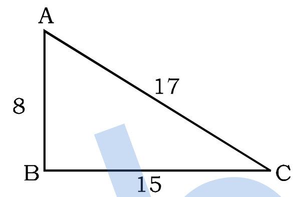
= Perimeter = a + b + c

= 40 cm (given)

area = 60 cm² (given)

In such questions take the help of triplets which form right angle triangle

[3,4,5
6,8,10
8,15,17
etc]



So, here we have a side 17 cm

$\Rightarrow$ by triplet we get sides 8 and 15

$\Rightarrow$ check the sides

perimeter = 8+15+ 17 = 40

area = $\frac{1}{2} \times 8 \times 15 \Rightarrow 60$

Hence sides are 15, 8.

smaller side = 8 cm.

102. (c) Let the side of the triangle be a

$\Rightarrow$ Perimeter = 3a

$3a = \left(\frac{\sqrt{3}}{4}a^2\right)\sqrt{3}$

$3 = \frac{3}{4}a$

a = 4 units

103. (a)

Area of $\triangle$ = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4} \times 36 = 9\sqrt{3}\ cm^2$

104. (b) Area of $\triangle = \frac{4}{3}$(Area of $\triangle$ formed by median as side)

$= \frac{4}{3}\left(\frac{1}{2} \times 9 \times 12\right)$

($\because$ 9,12,15 from triplet)

$= \frac{4}{3} \times 54 = 72\ cm^2$

105. (a) Let each side of the triangle be a units

$\Rightarrow \frac{\sqrt{3}}{4}((a+2)^2 - a^2) = 3 + \sqrt{3}$

$\frac{1}{4}(a^2 + 4 + 4a - a^2) = 1 + \sqrt{3}$

$\frac{1}{4}(4 + 4a) = 1 + \sqrt{3}$

$1 + a = 1 + \sqrt{3}$

$a = \sqrt{3}$ units

106. (c) $S = \frac{9 + 10 + 11}{2} = 15$ using heron's formula

Area $= \sqrt{s(s-9)(s-10)(s-11)}$

$= \sqrt{15 \times 6 \times 5 \times 4}$

$= \sqrt{1800} = 30\sqrt{2}$ cm²

107. (c) Let the length of each equal side be a unit

Area $= \frac{b}{4}\sqrt{4a^2 - b^2}$

$\Rightarrow \frac{\sqrt{3}}{2} = 4$

$\sqrt{4a^2 - 4} = 8$

$4a^2 - 4 = 64$

$a^2 - 1 = 16$

$a^2 = 17$

$a = \sqrt{17}$ units

108. (a) Sum of other two sides (a + b) = 32 – 11 = 21 and a – b = 5

$\Rightarrow a = \frac{21 + 5}{2} = 13$ cm

$b = \frac{21 - 5}{2} = 8$ cm

Sides of the $\triangle$ = 11,8,13 cm

$S = \frac{13 + 8 + 11}{2} = 16$

$\Rightarrow$ area $= \sqrt{16(16-13)(16-8)(16-11)}$

$= \sqrt{16 \times 3 \times 8 \times 5}$

$= 8\sqrt{30}$ cm²

109. (a) Area of two circles = $\pi(5^2 + 12^2) = 169\pi$ cm²

$\Rightarrow \pi r^2 = 169\pi$

$r^2 = 169$

$r = 13$ cm

$\therefore$ Radius of third circle = 13 cm

110. (b) side of square $= \sqrt{\text{area}}$

$= \sqrt{2}$ m

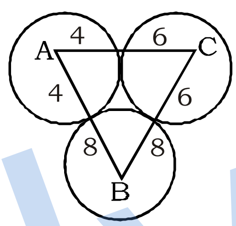
= Diameter of circle

$\Rightarrow$ Radius of circle $= \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$ m

$\therefore$ Area $= \frac{22}{7} \times \left(\frac{1}{\sqrt{2}}\right)^2$

$= \frac{\pi}{2}$ m²

111. (d)



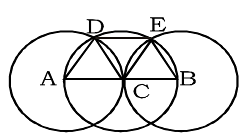
Side of $\triangle$ ABC = 10, 14, 12

$S = \frac{10 + 14 + 12}{2} = 18$

area $= \sqrt{s(s-a).(s-b)(s-c)}$

$= \sqrt{18 \times 8 \times 4 \times 6} = 24\sqrt{6}cm^2$

112. (b)



Area $\square$ ABED = 3 × ar $\triangle$ ADC

$= 3 \times \frac{\sqrt{3}}{4}(2)^2$ (ADC is an equilateral triangle)

$= 3\sqrt{3}$ units²

113. (c) Length of median $= \frac{\sqrt{3}}{2}$ a

$= 6\sqrt{3} = a = 12$ cm

$\therefore$ Perimeter = 12 × 3 = 36 cm

114. (a) Distance covered by small gear = $2\pi r \times 42$

$= 84\pi \times \frac{12}{2} = 504\pi$

= No. of revolution by big gear

$= \frac{504\pi}{2\pi \times 9} = 28$

115. (d) Perimeter of circle = $2\pi r$

= 2(18 + 26) = 88 cm

$\Rightarrow \pi r = 44$ cm

$r = 14$ cm

$\therefore$ Area of circle $= \frac{22}{7} \times 14 \times 14$

= 616 cm²

116. (c) Diameter of circle

$= \frac{\text{Diagonal}}{\sqrt{2}} = \frac{12\sqrt{2}}{\sqrt{2}} = 12$cm

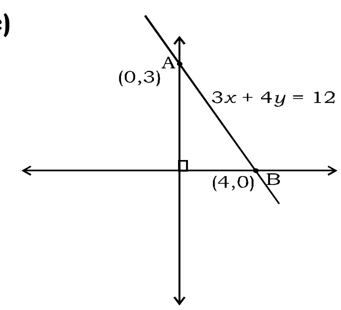
Radius of circle $= \frac{12}{2} = 6$ cm

Radius of circumcircle of equilateral $\triangle$

$= \frac{a}{\sqrt{3}}$

$\Rightarrow$ a = Radius × $\sqrt{3} = 6\sqrt{3}$ cm

117. (c)



3x + 4y = 12

$\frac{3x}{12} + \frac{4y}{12} = 1$

$\therefore$ Divide by 12 on both sides make R.H.S = 1

$\frac{x}{4} + \frac{y}{3} = 1$

$\therefore$ Co-ordinates of point A = (0,3)
point B = (4,0)

area of $\triangle OAB = \frac{1}{2} \times 4 \times 3$

= **6 sq units**

118. (c) height of equilateral $\triangle$

= 15 cm

$\frac{\sqrt{3}}{2}$ (side) = 15

side = $\frac{15 \times 2}{\sqrt{3}}$

area = $\frac{\sqrt{3}}{4}$ (side)^2

= $\frac{\sqrt{3}}{4}\left(\frac{15 \times 2}{\sqrt{3}}\right)^2 = \frac{\sqrt{3}}{4} \times \frac{225 \times 4}{3}$

= $\mathbf{75\sqrt{3}}$ **cm²**

119. (b) $\frac{\sqrt{3}}{4}(side)^2 = 9\sqrt{3}$

(side)^2 = 9 × 4 = 36

side = $\sqrt{36}$ = 6 cm

length of median = $\frac{\sqrt{3}}{2}(side)$

= $\frac{\sqrt{3}}{2}$ × 6 = $\mathbf{3\sqrt{3}}$ **cm**

Note: In an equilateral triangle, length of median, angle bisector, altitude is equal to $\frac{\sqrt{3}}{2}$ side

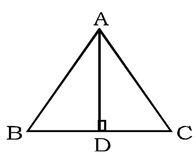
120. (c) $\frac{(8)^2}{(x)^2} = \frac{360}{250} = \frac{36}{25}$

$\frac{8}{x} = \sqrt{\frac{36}{25}} = \frac{6}{5}$

$x = \frac{40}{6} = \frac{20}{3} = \mathbf{6\frac{2}{3}}$ **cm**

Note: The ratio of areas of two similar triangles is equal to the ratio of square of their corresponding sides

121. (d)



AB = AC = $\frac{5}{6}$ BC

AB + BC + AC = 544

$\frac{5}{6}$ BC + BC + $\frac{5}{6}$ BC = 544

$\frac{5BC + 6BC + 5BC}{6}$ = 544

$\frac{16BC}{6}$ = 544

BC = $\frac{544 \times 6}{16}$ = 204

$\Rightarrow$ AB = AC = $\frac{5}{6} \times 204$ = 170 cm

Area of $\triangle ABC = \frac{b}{4}\sqrt{4a^2 - b^2}$

$\therefore$ Where a = equal side

b = base

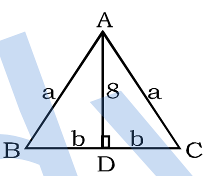
= $\frac{204}{4}\sqrt{4(170)^2 - (204)^2}$

= $51\sqrt{11560 - 41616}$

= 51 × $\sqrt{73984}$

= 51 × 272 = **13872 cm²**

122. (d)



Let, AB = AC = a cm

BD = DC = b cm

$\therefore$ Altitude of isosceles triangle is also median

In right $\triangle ADC$

AD^2 = a^2 – b^2

64 = a^2 – b^2 ....(i)

Perimeter = 64

a + a + 2b = 64

2a+ 2b = 64

a + b = 32 ....(ii)

On dividing $\frac{a^2 - b^2}{a + b} = \frac{64}{32}$ = 2

$\therefore$ a^2 – b^2 = (a + b) (a–b)

a – b = 2

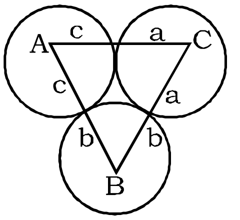
$\therefore$ a + b = 32

On solving a = 17 , b = 15

area of $\triangle ABC$ = $\frac{1}{2}$ × AD × BC

= $\frac{1}{2}$ × 8 × 30 = 120 cm²

123. (a)



x = AB = b + c

y = BC = a + b

z = AC = a + c

$\therefore$ semi-perimeter (s)

= $\frac{AB + BC + AC}{2} = \frac{2a + 2b + 2c}{2}$

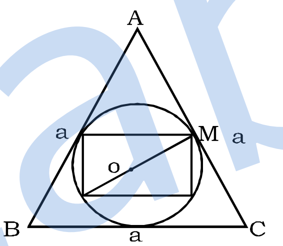
= a + b + c

Area of

$\triangle ABC = \sqrt{s(s-x)(s-y)(s-z)}$

= $\sqrt{(\mathbf{a+b+c})\mathbf{abc}}$

124. (c)



Let the side of equilateral triangle = 'a' and the side of square = 'b'

in circle radius of equilateral

$\triangle$ = $\frac{a}{2\sqrt{3}}$

$\therefore$ Diagonal of square = $2\frac{a}{2\sqrt{3}}$

= $\frac{a}{\sqrt{3}}$

Now, b = $\frac{Diagonal}{\sqrt{2}} = \frac{\frac{a}{\sqrt{3}}}{\sqrt{2}} = \frac{a}{\sqrt{6}}$

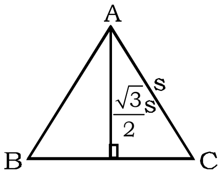
Required ratio = $\frac{\frac{\sqrt{3}}{4}a^2}{\left(\frac{a}{\sqrt{6}}\right)^2} = \frac{\sqrt{3}}{4}a^2 \times \frac{6}{a^2}$

= $\frac{3\sqrt{3}}{2}$

$\Rightarrow$ $\mathbf{3\sqrt{3} : 2}$

125. (c) Let the side of equilateral triangle = s

area of equilateral = $\frac{\sqrt{3}}{4}s^2$



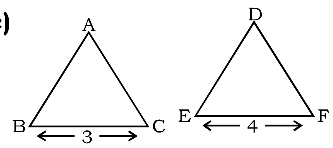
height of equilateral triangle

$= \frac{\sqrt{3}}{2}s$

$\frac{b^2}{a} = \frac{\left(\frac{\sqrt{3}}{2}s\right)^2}{\frac{\sqrt{3}}{4}s^2} = \frac{\frac{3}{4}s^2}{\frac{\sqrt{3}}{4}s^2} = \frac{3}{\sqrt{3}}$

$= \sqrt{3}$

126. (c)



$\triangle ABC \sim \triangle DEF$

$\frac{ar(\triangle ABC)}{ar(\triangle DEF)} = \frac{3^2}{4^2}$

$\frac{54}{ar(\triangle DEF)} = \frac{9}{16}$

$ar(\triangle DEF) = \frac{16 \times 54}{9}$ =**96 cm²**

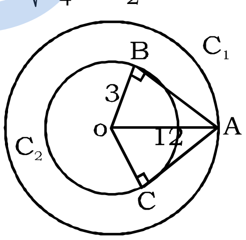
127. (b) $\frac{ar(\triangle ABC)}{ar(\triangle DEF)} = \frac{AB^2}{DE^2}$

$\frac{20}{45} = \frac{25}{DE^2}$

$DE^2 = \frac{45 \times 25}{20} = \frac{225}{4}$

$DE = \sqrt{\frac{225}{4}} = \frac{15}{2}$ = **7.5 cm**

128. (c)



AB = AC tangents drawn from the same point

OB = OC = 3 cm

OA = 12 cm

$\angle ABO = \angle ACO$ = 90°

In Right triangle $\triangle ABO$

$AB = \sqrt{12^2 - 3^2} = \sqrt{135}$

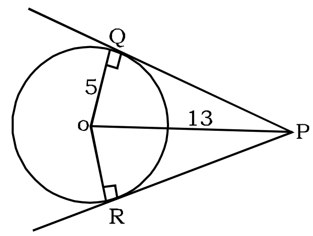
$= \sqrt{15 \times 9} = 3\sqrt{15}$

ar ABOC = 2× ar(ABO)

$= 2 \times \frac{1}{2} \times AB \times OB$

$= 3\sqrt{15} \times 3 =$ **$9\sqrt{15}$** cm²

129. (b)



$\angle OQP = \angle ORP = 90°$

(radius is $\perp$ tangent)

and PQ = PR (tangent drawn from same point are equal)

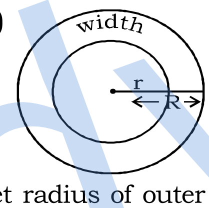
$PQ = \sqrt{OP^2 - OQ^2} = \sqrt{13^2 - 5^2} = 12$

ar of (PQOR) = 2 × ar(PQO)

$= 2 \times \frac{1}{2} \times PQ \times OQ$

= 12 × 5 = 60 cm²

130. (a)



Let radius of outer circle = R

and radius of inner circle = r

ATQ $2\pi R - 2\pi r = 66$

$2\pi(R - r) = 66$

$R - r = \frac{66}{2\pi} = \frac{66 \times 7}{2 \times 22} = \frac{21}{2}$

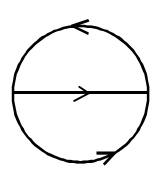
width = **10.5 m**

131. (d) Distance covered in 30 seconds

$= 30 \text{ m/min} \times \frac{30}{60} = 15$ m

This is the difference of distance of the boundary and the diameter

Let 'R' be the radius



$2\pi R - 2R = 15$

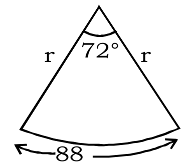
$2R(\pi - 1) = 15$

$2R = \frac{15}{\pi - 1} = \frac{15}{\frac{22}{7} - 1}$

$= \frac{15 \times 7}{15} = 7$

$R = \frac{7}{2} = 3.5$ m

132. (a)

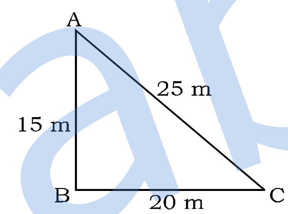


Length of arc = $\frac{\theta}{360} \times 2\pi r$

$\frac{72}{360} \times 2 \times \frac{22}{7} \times r = 88$

$r = \frac{88 \times 7 \times 360}{72 \times 2 \times 22}$ = **70 m**

133. (c)



∴ 15,20,25 form a triplet

Clearly, 25² = 15² + 20²

ABC is a right triangle

Area of Right $\triangle ABC$

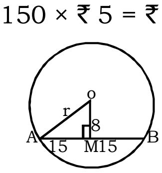
$= \frac{1}{2} \times AB \times BC$

$= \frac{1}{2} \times 15 \times 20 = 150$

Cost of sowing seeds

= 150 × ₹ 5 = ₹ **750**

134.(a)



AB = 30 cm

OM $\perp$ AB and OM = 8

∴ AM = BM = 15 cm

In Right $\triangle OMA$

OA² = OM² + AM²

OA² = 15² + 8²

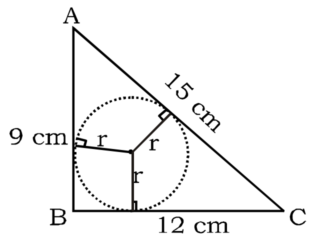
OA² = 289

AO = $\sqrt{289}$

OA = 17 cm

Radius of circle = **17 cm**

135. (c)



Since, 9,12,15 forms a triplet

Area of $\triangle ABC = \frac{1}{2} \times 9 \times 12$

$= 54 \text{ cm}^2$

In circle radius of triangle

$= \frac{\text{area of triangle}}{\text{semiperimeter of triangle}}$

$= \frac{54}{\frac{9+15+12}{2}} = \frac{54 \times 2}{36} = 3 \text{ cm}$

Alternate:

In a right triangle, with, P, B and H incircle radius

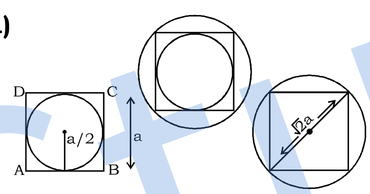
$= \frac{P+B-H}{2}$

Hence, $r = \frac{9+12-15}{2} = \frac{6}{2} = 3\text{ cm}$

Also Circum circle radius

$= \frac{H}{2} = \frac{15}{2} = 7.5 \text{ cm}$

136.(a)



Let the side of square = a

In circle radius of square = $\frac{a}{2}$

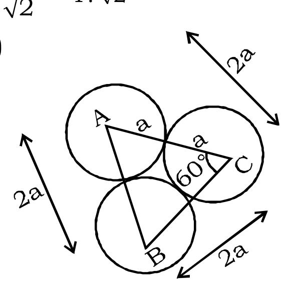
circumcircle radius of square

$= \frac{Diagonal}{2} = \frac{a\sqrt{2}}{2}$

$\therefore \frac{\text{Incircle radius}}{\text{Circumcircle radius}} = \frac{\frac{a}{2}}{\frac{a\sqrt{2}}{2}}$

$= \frac{1}{\sqrt{2}} = 1:\sqrt{2}$

137. (d)



Hence

ABC is the equilateral triangle

AB = BC = AC = '2a' cm

Area of $\triangle ABC = \frac{\sqrt{3}}{4}(2a)^2$

$= \frac{\sqrt{3}}{4} \times 4a^2 = \sqrt{3}\, a^2$

Area of 3 sectors of $\theta = 60°$

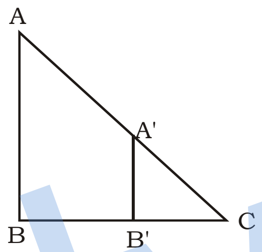
$= 3 \times \frac{60°}{360°} \times \pi a^2 = \frac{\pi a^2}{2}$

Area of shaded region = area of $\triangle ABC$ – area of 3 sector

$= \sqrt{3}a^2 - \frac{\pi a^2}{2}$

$= \left(\frac{2\sqrt{3}-\pi}{2}\right) a^2 \text{ cm}^2$

138.(c)



In Δ ABC and Δ A'B'C

$\angle C = \angle C$ (common)

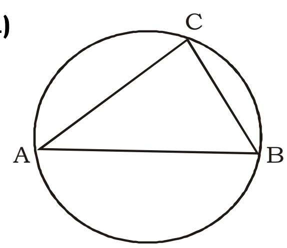
$\angle B' = \angle B$ ($\because$ AB | | A'B')

$\Rightarrow \Delta ABC \sim \Delta A'B'C$

$\Rightarrow \frac{area\Delta A'B'C}{area\Delta ABC} = \left(\frac{B'C}{BC}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

$\Rightarrow$ ar Δ A'B'C $= \frac{1}{4}$(area Δ ABC)

139. (d)



$\angle ACB = 90°$

(angle in semi-circle)

AC : BC = 3 : 4

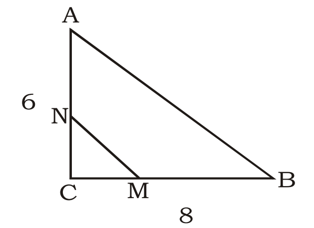
$AB^2 = \sqrt{AC^2+BC^2} = \sqrt{3^2+4^2}$

= 5 units

5 units = 5 cm

$\therefore$ ar $\Delta ABC = \frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$

140. (a)



ar $\Delta BCA = \frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$

$\Delta BCA \sim \Delta MCN$

$\angle C = \angle C$

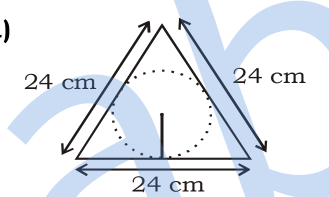
$\angle M = \angle B$ ($\because$ MN | | AB)

$\therefore \frac{ar\Delta MCN}{ar\Delta BCA} = \left(\frac{CM}{BC}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

ar $\square$ MNAB = ar Δ ABC – ar Δ CMN = 4 – 1 = 3

$\therefore$ ar $\square$ MNAB $= \frac{24}{4} \times 3 = 18 \text{ cm}^2$

141. (a)



Inradius of an equilateral triangle $= \left(\frac{\text{side}}{2\sqrt{3}}\right) = \frac{24}{2\sqrt{3}}$

$= 4\sqrt{3}$ cm

Area of equilateral triangle

$= \frac{\sqrt{3}}{4} \times (\text{side})^2 = \frac{\sqrt{3}}{4} \times 24 \times 24$

$= \sqrt{3} \times 6 \times 24$

$= 144\sqrt{3} \text{ cm}^2$

= 144 × 1.732

= 249.408 cm²

Now,

Area of incircle

$= \frac{22}{7} \times (\text{Inradius})^2$

$= \frac{22}{7} \times 4\sqrt{3} \times 4\sqrt{3}$

$= \frac{22 \times 16 \times 3}{7} = \frac{1056}{7}$

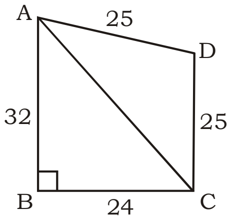
= 150.86 cm²

Area of remaining part = area of Δ – area of incircle

= 249.408 – 150.86

= **98.548 cm²**

142. (d)



$\angle ABC = 90^\circ$

$AC = \sqrt{AB^2 + BC^2} = \sqrt{32^2 + 24^2}$

$= \sqrt{1024 + 576}$

$= \sqrt{1600} = 40$ m

Now,

area of Δ ABC

$= \frac{1}{2} \times AB \times BC$

$= \frac{1}{2} \times 32 \times 24 = 384\text{cm}^2$

Now,

In ΔADC,

$s = \frac{25 + 25 + 40}{2} = 45$ m

area of Δ ADC $= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{45(45-25)(45-25)(45-40)}$

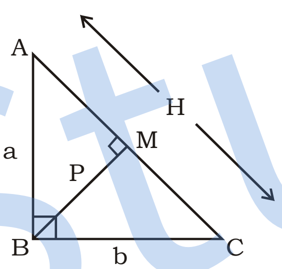
$= \sqrt{45 \times 20 \times 20 \times 5} = 20 \times 3 \times 5$

$= 300$ m²

Area of the plot

$= 384 + 300 = 684$ m²

143.(c)

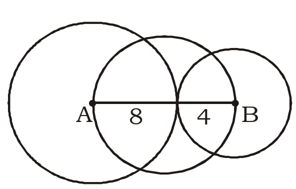


Length of perpendicular drawn from the right angle to hypotenuse, $P = \frac{a \times b}{H}$

$P^2 = \frac{a^2 b^2}{H^2}$

$P^2 = \frac{a^2 b^2}{a^2 + b^2}$ $(\because H^2 = a^2 + b^2)$

144. (a)



Diameter of the circle

AB = 8 + 4 = 12 units

Radius $= \frac{12}{2} = 6$ units

$\therefore$ Area of circle

$= \pi r^2 = \pi \times (6)^2$

$=$ **36π sq. units**

145. (a) Height of equilateral triangle = area of triangle

$\frac{\sqrt{3}}{2}(\text{side}) = \frac{\sqrt{3}}{4}(\text{side})^2$

side = 2 units

146. (a) Let the length of side of square = a

Let the diameter of circle = d

According to question,

a = d

$\therefore \frac{\text{area of square}}{\text{area of circle}} = \frac{a^2}{\pi\left(\frac{d^2}{4}\right)}$

$= \frac{a^2 \times 4}{\pi d^2} = \frac{a^2 \times 4}{\pi a^2}$

$= \frac{4}{\pi} = \frac{4 \times 7}{22} = \frac{14}{11}$

$\Rightarrow$ 14 : 11

147. (b) $\pi r^2 = 2\pi r$

r = 2 units

$\therefore$ Area of circle $= \pi (2)^2$

$= 4\pi$ sq. units

148. (b) Ratio = 5 : 6 : 7

sum of sides = perimeter = 18

sides, $\frac{5}{18} \times 54 = 15$

$\frac{6}{18} \times 54 = 18$

$\frac{7}{18} \times 54 = 21$ metres

$S = \frac{15 + 18 + 21}{2} = 27$

$\therefore$ Area of Δ

$= \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{27 \times 12 \times 9 \times 6} = 54\sqrt{6}$ m²

149.(a) circumference of circle

$= \pi \times$ diameter

$= \frac{22}{7} \times 112 = 352$ cm

$\therefore$ Perimeter of rectangle = 352

2 (l + b) = 352

$l + b = \frac{352}{2} = 176$

$\therefore$ smaller side $= \frac{7}{16} \times 176$

= **77 cm**

150. (c) Perimeter of equilateral triangle = 18 cm

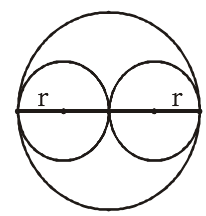
3 × side = 18 cm

side $= \frac{18}{3} = 6$cm

length of median

$= \frac{\sqrt{3}}{2}$ side $= \frac{\sqrt{3}}{2} \times 6 =$ $\mathbf{3\sqrt{3}}$ **cm**

151.(a)



Circumference of paper sheet = 352

$2\pi R = 352$

$R = \frac{352}{2\pi} = \frac{352 \times 7}{2 \times 22} = 56$ cm

$r = \frac{R}{2} = \frac{56}{2} = 28$ cm

$\therefore$ Circumference of circular plate $= 2\pi r$

$= 2 \times \frac{22}{7} \times 28 = 176$ cm

152. (b) Circumference of circle $= \pi d$

$\therefore \pi d - d = 150$

$d(\pi - 1) = 150$

$d\left(\frac{22}{7} - 1\right) = 150$

$d \times \frac{15}{7} = 150$

$d = \frac{150 \times 7}{15} = 70$

Radius $= \frac{d}{2} = \frac{70}{2} =$ **35m**

153. (b) Let radius of circle = R

Side of square = a

Side of equilateral Δ = b

According to question,

$2\pi R = 4a = 3b$

$\therefore a = \frac{\pi R}{2}$ $b = \frac{2}{3}\pi R$

Ratio of their areas:

$\pi R^2 : a^2 : \frac{\sqrt{3}}{4} b^2$

$\pi R^2 : \left(\frac{\pi R}{2}\right)^2 : \frac{\sqrt{3}}{4}\left(\frac{2}{3}\pi R\right)^2$

$1 : \frac{\pi}{4} : \frac{\sqrt{3}}{9}\pi$

C : S : T

Here, we can see that C > S > T

Quicker Approach : When perimeter of two or more figures are same then the figure who has more vertex is greater in the area. Since, here, circle has infinite vertex.

Therefore, C > S > T

154. (d) Distance covered in 1 revolution = Circumference of circular field = $2\pi r$

Distance = speed × time

$= 66 \text{ m/s} \times \frac{5}{2}\text{s} = 165 \text{ m}$

$\therefore 2\pi r = 165$

$2 \times \frac{22}{7} \times r = 165$

$r = \frac{165 \times 7}{2 \times 22} =$ **26.25 m.**

155. (c) Circumference of front wheel × no. of its revolutions = circumference of rear wheel × no. of its revolutions

$2\pi x \times n = 2\pi y \times m$ (let 'm' is the revolution of rear wheel)

$m = \frac{nx}{y}$

156. (d) Let a triangle ABC has sides of measurement 3 cm, 4cm and 5 cm

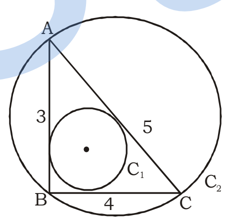
using triplets (3, 4, 5)

$\Rightarrow$ Δ ABC will be a right angled triangle

$\Rightarrow$ Inner radius of circle C_1

$= \frac{AB + BC - CA}{2} = \frac{4+3-5}{2}$

= **r = 1cm**



$\Rightarrow$ Circum-radius of circle C_2

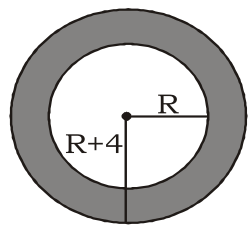
$R = \frac{\text{Hypotenuse}}{2}$

In a right angled triangle half of hypotenuse is circum radius

$R = \frac{5}{2} = 2.5$ cm

$\Rightarrow \frac{\text{Area of } C_1}{\text{Area of } C_2} = \frac{\pi r^2}{\pi R^2} = \frac{1^2}{\left(\frac{5}{2}\right)^2} = \frac{4}{25}$

157. (d) Let the radius of Swimming Pool = R



Outer radius of Pool with concrete wall = (R + 4)

According to question

$\pi R^2 \times \frac{11}{25} = \pi (R+4)^2 - \pi R^2$

$R^2 \times \frac{11}{25} = R^2 + 16 + 8R - R^2$

$\frac{11}{25} R^2 = 16 + 8R$

$11R^2 - 200R - 400 = 0$

By option (d),(In such type of equation go through the option to save your valuable time

R = 20

$11 \times (20)^2 - 200 \times 20 - 400 = 0$

$4400 - 4000 - 400 = 0$

0 = 0 (satisfy)

Therefore, radius of pool R = 20 m

Alternate:-

Let the swimming pool area = 25

Outer concrete area = 11

Total area = 25 + 11 = 36

area of total : area of pool

36 : 25

Ratio of radius

6 : 5

Difference 1 Unit = 4

5 × 4 = 20

Radius of swimming pool = 20 m

158. (a) Area of circle = A

Radius of circle = r

Circumference of circle = c

$\pi r^2 = A$ ....(i)

$2\pi r = c$ ...(ii)

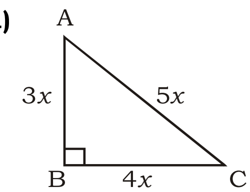
From (i) ÷ (ii)

$\frac{\pi r^2}{2\pi r} = \frac{A}{C}$

$\frac{r}{2} = \frac{A}{C}$

rc = 2A

159. (d)



Area of right angled triangle = 7776

$\Rightarrow \frac{1}{2} \times 4x \times 3x = 7776$

$\Rightarrow 6x^2 = 7776$

$\Rightarrow x^2 = 1296$

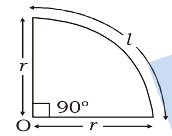
$\Rightarrow x = 36$

$\Rightarrow$ Perimeter of triangle

$= 3x + 4x + 5x = 12x$

= 12 × 36 = 432 cm

160.(b)



According to the figure,

$\Rightarrow$ Perimeter = $r + r + l$

$\Rightarrow$ 75 cm = 2r + length of arc

$\Rightarrow 75 \text{ cm} = 2r + \frac{2\pi r}{4}$

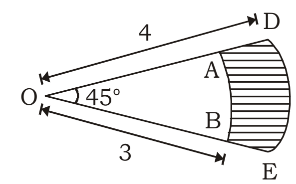
$\Rightarrow 75 \text{ cm} = 2r + \frac{22 \times r}{7 \times 2}$

$\Rightarrow$ r = 21 cm.

$\Rightarrow$ Its area

$= \frac{1}{4}\left[\frac{22}{7} \times 21 \times 21\right] = 346.5 \text{ cm}^2$

161. (d)



According to the question,

Area of sector OED

$= \pi r^2 \times \frac{\theta}{360} = \pi \times 4 \times 4 \times \frac{45}{360}$

$= 2\pi \text{ m}^2$

Area of the sector OAB

$= \pi r^2 \times \frac{\theta}{360} = \pi \times 3 \times 3 \times \frac{45}{360}$

$= \frac{9}{8}\pi \text{ m}^2$

So, Area of shaded portion = Area of OED – Area of OAB

$= 2\pi - \frac{9}{8}\pi = \frac{16\pi - 9\pi}{8}$

$= \frac{7}{8}\pi = \frac{7}{8} \times \frac{22}{7} = \frac{11}{4} \text{m}^2$

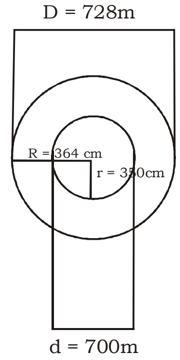
162. (d) According to the question,
Circumference of a circle
$= 2\pi r$

$$2\pi r = \frac{30}{\pi}$$

$$r = \frac{15}{\pi^2}$$

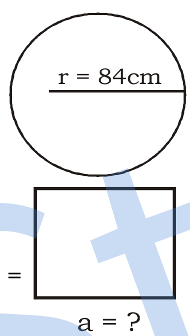
$$D = 2r = \frac{30}{\pi^2}$$

163. (b) According to the question



The breadth of the path
$= (R - r)$
$= (364 - 350)$cm $= 14$ cm

164. (c) According to the questions,



Let the length of side of the square be a cm
(circumference) C = 4a (perimeter square

$$2 \times \frac{22}{7} \times 84 = 4a$$

132 cm = a

165. (a) Area of circle $= 324\pi\,cm^2$
$\pi r^2 = 324\pi$
r = 18cm
Longest chord = diameter = 2r
= 2×18 = 36 cm

166. (c) Circumference of a Δ
= 24 cm
a + b + c = 24 cm

or $S = \frac{a+b+c}{2} = 12$ cm

Circumference of incircle
$2\pi r$ (inner) = 44 cm
r (inner) = 7 cm
Area of Δ = S × r (inner)
= 12 × 7 = 84 cm^2

167. (a) According to the question

$$r = \frac{\Delta}{S}$$

$$\text{Semiperimeter} = \frac{50}{2} = 25$$

Inner radius

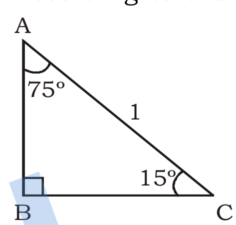
$$= \frac{\text{Area}}{\text{Semi-perimeter}}$$

(Semiperimeter)

$$6 = \frac{\text{Area}}{25}$$

Area = 150 cm^2

168. (b) According to the question,



$$\text{Sin}15^\circ = \frac{P}{H} = \frac{AB}{1}$$

AB = sin15°

$$\text{Cos}15^\circ = \frac{B}{H} = \frac{BC}{1}$$

BC = Cos15°

$$\text{Area of } \Delta ABC = \frac{1}{2} \times AB \times BC$$

$$= \frac{1}{2} \times \sin 15^\circ \cos 15^\circ$$

$$= \frac{1}{4} \times \sin 2 \times 15$$

$[\because \sin 2\theta = 2\sin\theta\cos\theta]$

$$= \frac{1}{4} \times \sin 30^\circ$$

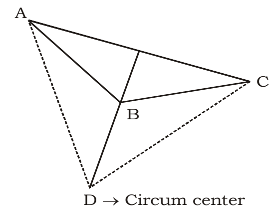
$$= \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}\,m^2$$

$$= \frac{1}{8} \times 100 \times 100$$

= 1250 cm^2

169. (c) As we know circum centre always made by the intersection of half altitude

$\Rightarrow$ In obtuse angle it will always be out side of triangle



170. (a) According to the question,
$2\pi r \rightarrow$ circumference
$2r \rightarrow$ Diameter

$$\Rightarrow \frac{2\pi r}{2r} = \frac{22}{7}$$

$$\Rightarrow \frac{1\frac{4}{7}}{2r} = \frac{22}{7}$$

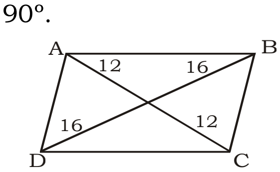
$$\Rightarrow \frac{11}{7 \times 2r} = \frac{22}{7}$$

$$\Rightarrow \frac{1}{2r} = \frac{2}{1}$$

$$\Rightarrow r = \frac{1}{4}\,m$$

171. (b) Given:
$\Rightarrow$ Area of square = 4
$side^2 = 4$
side = 2
$\Rightarrow$ Diagonal of square = radius of circle
$\sqrt{2}\,side = r$
$\Rightarrow r = 2\sqrt{2}$
$\Rightarrow$ Area of circle = πr^2
$\Rightarrow \pi \times (2\sqrt{2})^2 = 8\pi\ cm^2$

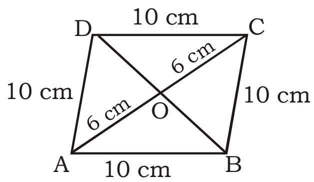
172. (a) We know that rhombus is parallelogram whose all four sides are equal and its diagonals bisect each other at 90°.



$\therefore AB = \sqrt{16^2 + 12^2}$
$= \sqrt{400} = 20$cm
= Side of rhombus
$\therefore$ Perimeter of the rhombus
= 20 × 4
= 80cm

173. (c) $4 \times \text{side} = 40$ cm (given)

$\Rightarrow$ side $= \frac{40}{4} = 10$ cm



In Δ AOB,

$OB = \sqrt{10^2 - 6^2} = \sqrt{100 - 36}$

$= \sqrt{64} = 8$cm

Diagonal, BD $= 8 \times 2$

$= 16$ cm.

Alternative:-

Side of rhombus

$= \frac{1}{2}\sqrt{d_1^2 + d_2^2}$

$10 = \frac{1}{2}\sqrt{12^2 + d^2}$

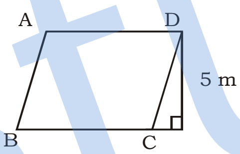
$20 = \sqrt{144 + d_2^2}$

$144 + d_2^2 = 400$

$d_2^2 = 400 - 144 = 256$

$d_2 = \sqrt{256} = 16$ cm

174. (b)



$4 \times$ side of rhombus $= 40$ m

Side of rhombus $= 10$ m

Since rhombus is also a parallelogram therefore its area = base × height

$= 10 \times 5 = 50$ m²

175. (b) diagonal, $d_1 = 10$ cm Area of Rhombus

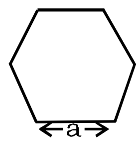
$= 150$ cm²

$\frac{1}{2} \times d_1 \times d_2 = 150$

$\frac{1}{2} \times 10 \times d_2 = 150$

$d_2 = \frac{150 \times 2}{10} = 30$ cm

176. (a)



A regular hexagon consists of 6 equilateral triangle

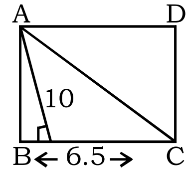
Area of regular hexagon

$= 6 \times \frac{\sqrt{3}}{4}(\text{side})^2 = 6 \times \frac{\sqrt{3}}{4} a^2$

$= 6 \times \frac{\sqrt{3}}{4} \times \left(2\sqrt{3}\right)^2$

$= 6 \times \frac{\sqrt{3}}{4} \times 12 = 18\sqrt{3}$ cm²

177. (a)



($\therefore$ Rhombus is a ||gm $\therefore$ area of Rhombus = base × height)

Area of Rhombus

= base × height

$= 6.5 \times 10 = 65$ cm²

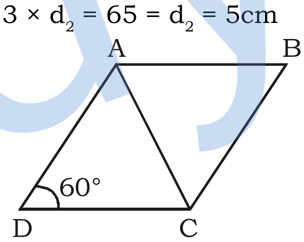
Also area of Rhombus

$= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 26 \times d_2 = 65$

$= 13 \times d_2 = 65 = d_2 = 5$cm

178. (a)



In the above figure ΔADC is equilateral triangle (as AC is angle bisector)

$\Rightarrow$ AC = 10 cm (smaller diagonal

179. (c) Side of rhombus $= \frac{100}{4}$

$= 25$ cm

we know that in a rhombus

$4a^2 = d_1^2 + d_2^2$

$\Rightarrow d_2^2 = 4 \times (25)^2 - (14)^2$

$= 2500 - 196 = 2304$

$\Rightarrow d_2 = \sqrt{2304} = 48$ cm

$\Rightarrow$ Area $= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 14 \times 48 = 336$ cm²

180.(d) Let the parallel sides be $3x$ and $2x$

$\Rightarrow \frac{1}{2}(3x + 2x) \times 15 = 450$

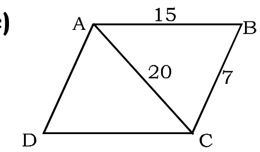
$\Rightarrow 5x = 60$

$\Rightarrow x = 12$

$\Rightarrow$ Sum of length of parallel sides

$= (3 + 2) \times 12 = 60$ cm

181. (c)



Using Heron's formula

$S = \frac{15 + 7 + 20}{2} = 21$ cm

Area of ΔABC =

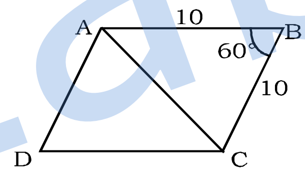
$\sqrt{21(21-20)(21-7)(21-15)}$

$= \sqrt{21 \times 1 \times 14 \times 6} = 42$ cm²

$\Rightarrow$ Area of □ABCD $= 42 \times 2$

$= 84$ cm²

182.(b)



as □ ABCD is a rhombus

$\therefore$ ΔABC is equilateral

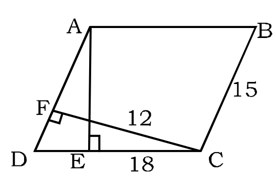
$\Rightarrow$ ar ΔABC $= \frac{\sqrt{3}}{4} \times 10 \times 10$

$= 25\sqrt{3}$ cm²

$\Rightarrow$ ar □ABCD $= 25\sqrt{3} \times 2$

$= 50\sqrt{3}$ cm²

183. (b)



Area of parallelogram

$= BC \times FC = 15 \times 12$

$= 180$ cm²

Area of parallelogram

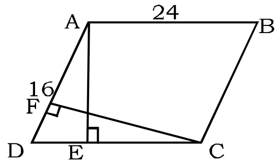
$= DC \times AE = 180$

$18 \times AE = 180$

$AE = 10$ cm

$\therefore$ Distance between bigger sides $= 10$ cm

184. (a)



AB = 24 cm

AD = 16 cm

AE = 10 cm (Given)

Area of Parallelogram = AE × DC = 10 × 24 = 240 cm²

Also, area of Parallelogram

= FC × AD = 240

FC × 16 = 240

FC = 15

∴ Distance between AD and BC = 15 cm

185. (a) In a rhombus

$4a^2 = d_1^2 + d_2^2$

$4a^2 = 8^2 + 6^2$

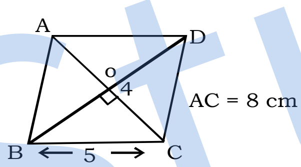
$a^2 = \frac{100}{4} = 25$

$a = 5$

⇒ Side of square = 5 cm

∴ Area of square = 25 cm²

186. (d) Side of rhombus = $\frac{20}{4}$ = 5 cm



OC = 4 cm

In Right $\triangle OBC$

$OB^2 = BC^2 - OC^2$

$= 5^2 - 4^2 = 9$

$OB = \sqrt{9} = 3$ cm

BD = 2 × OB= 2 × 3 = 6 cm

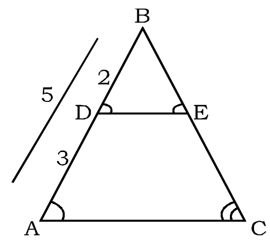
Area of Rhombus

$= \frac{1}{2} \times AC \times BD$

$= \frac{1}{2} \times 8 \times 6 =$ **24 cm²**

Note : In this type of question do not get confused with the words non – square its simply to clear that it is Rhombus

187. (d)



∴ DE | | AC

∴ $\triangle BDE \sim \triangle BAC$

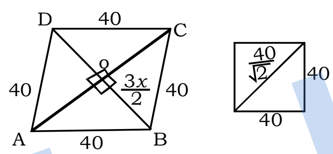
$\frac{ar(BDE)}{ar(BAC)} = \frac{2^2}{5^2} = \frac{4}{25}$

ar(trap.ACED) = ar(BAC) – ar(BDE)

= 25 – 4 = 21

$\therefore \frac{ar(ACED)}{ar(BDE)} = \frac{21}{4} =$ **21 : 4**

188.(d)



Let AC = $4x$ and BD = 3x

∴ OA = $2x$ and OB = $\frac{3x}{2}$

In Right $\triangle OAB$

$\sqrt{(2x)^2 + \left(\frac{3x}{2}\right)^2} = 40$

$4x^2 + \frac{9x^2}{4} = 40^2 = 1600$

$16x^2 + 9x^2 = 1600 \times 4$

$25x^2 = 6400$

$x^2 = \frac{6400}{25}$

$x = \sqrt{\frac{6400}{25}} = \frac{80}{5} =$ **16**

∴ AC = 4x = 4 × 16 = 64

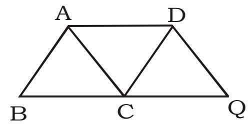
BD = 3x = 3 × 16 = 48

area = $\frac{1}{2}$ × AC × BD

$= \frac{1}{2} \times 64 \times 48$

= **1536 cm²**

189. (a)



in ΔABC & ΔDCQ

∠ABC = ∠DCQ

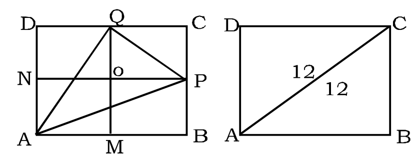
∠ACB = ∠DQC

BC = CQ

$\Delta ABC \cong \Delta DCQ$

$ar\Delta ABC = ar\Delta DCQ$

190. (c)



area of ABCD = 24

Draw QM and PN and intersect them at O

ar□$POQC = \frac{1}{4} \times 24 = 6$

∴ Area PQC = $\frac{1}{2} \times 6 = 3$

PQC = 3

QMAD = $\frac{1}{2} \times 24 = 12$

QAD = $\frac{1}{2} \times 12 = 6$

arABP = 6

ar(PQC)+ ar(QAD)+ar(ABP) = 15

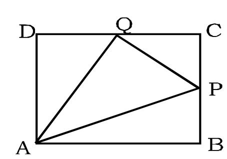
ar(APQ) = 24 – 15 = 9 cm²

also

$\frac{ar(APQ)}{ar(ABCD)} = \frac{9}{24} = \frac{3}{8}$

∴ always it will be **3 : 8**

Alternate:-



In this question

$\Delta APQ = \frac{3}{8}(\Delta ABCD)$

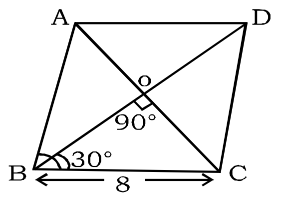
∵ ΔABC = 12

∴ ABCD = 2 × 12 = 24

Δ APQ = $\frac{3}{8}$ × 2 Δ ABC

$= \frac{3}{8}(2 \times 12) = \frac{3}{8} \times 24 =$ **9 cm²**

191.(a)



Let $\angle ABC = 60°$

$\angle OBC = 30°$

$\therefore$ Diagonals of Rhombus are the angle bisectors

In right $\triangle BOC$

$\frac{OB}{BC} = \text{Cos } 30°$

$\frac{OB}{8} = \frac{\sqrt{3}}{2}$

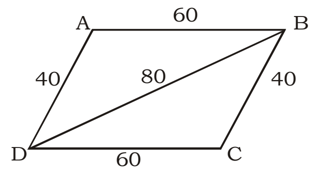
$OB = 4\sqrt{3}$

$\therefore BD = 2 \times OB$

$= 2 \times 4\sqrt{3}$

$= 8\sqrt{3}$ cm

192.(b)



$S(\triangle ABD) = \frac{60+80+40}{2} = 90$

ar $\triangle ABD$

$= \sqrt{90(90-80)(90-60)(90-40)}$

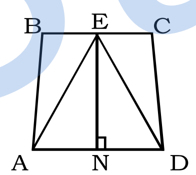
$= \sqrt{90 \times 10 \times 30 \times 50}$

$= 300\sqrt{15}\ m^2$

ar $\square ABCD = 2 \times$ ar $\triangle ABD$

$= 600\sqrt{15}\ m^2$

193. (d)



Let $EN \perp AD$

Area of $\triangle AED = \frac{1}{2} \times EN \times AD$

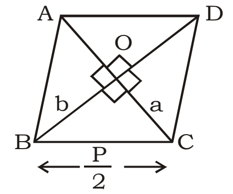
Area of trapezium ABCD

$= \frac{1}{2}(AD + BC) \times EN$

$\frac{ar(ABCD)}{ar(AED)} = \frac{\frac{1}{2}(AD+BC) \times EN}{\frac{1}{2} \times EN \times AD}$

$= \frac{AD+BC}{AD}$

194. (c)



Side of Rhombus

$= \frac{\text{perimeter}}{4} = \frac{2P}{4} = \frac{P}{2}$

Let, $AC = 2a$

$\therefore OA = OC = a$

$BD = 2b$

$OB = OD = b$

In Right Δ OBC,

$a^2 + b^2 = \frac{P^2}{4}$

$4a^2 + 4b^2 = P^2$ .....(i)

Also, $2a + 2b = m$

on squaring, $4a^2 + 4b^2 + 8ab = m^2$

$4a^2 + 4b^2 = m^2 - 8ab$ ...(ii)

from (i) and (ii)

$m^2 - 8ab = P^2$

$8ab = m^2 - P^2$

$4 \times (2ab) = m^2 - P^2$

$2ab = \frac{1}{4}(m^2 - P^2)$

Area of Rhombus

$= \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 2a \times 2b$

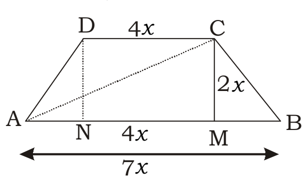
$= 2ab = \frac{1}{4}(m^2 - P^2)$

195. (a) Area of trapezium

$= \frac{1}{2}(6+8) \times 4 = \frac{1}{2} \times 14 \times 4$

$= 28\ cm^2$

196. (a)



Area $= \frac{1}{2}$ (sum of parallel sides)$\times$ distance between them

$\frac{1}{2}(7x + 4x) \times 2x = 176$

$11x^2 = 176 \Rightarrow x^2 = 16$

$\Rightarrow x = 4$

$AB = 7 \times 4 = 28$ cm

$CD = 4 \times 4 = 16$ cm

$CM = 2 \times 4 = 8$ cm

AM=AN+NM

$\Rightarrow$ AN+16

$\Rightarrow 6+16=22$

$(AN=BM=\frac{12}{2}=6)$

$AC^2 = CM^2 + AM^2$

$AC^2 = 8^2 + 22^2$

$AC = \sqrt{64+484} \Rightarrow \sqrt{548} \Rightarrow 2\sqrt{137}$

197. (a) Let the diagonal of rhombus

$d_1 = x$ & $d_2 = 2x$

Area of rhombus

$= \frac{1}{2} d_1 d_2$

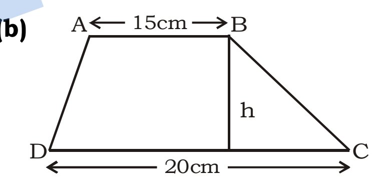
$256 = \frac{1}{2}(x)(2x)$

$16 = x$

Longer diagonal

$= 2x = 2 \times 16 = 32$ cm

198. (b)



As we know

$\Rightarrow$ Area of trapezium

$= \frac{1}{2}(\text{sum of parallel sides}) \times \text{height}$

$\Rightarrow 175 = \frac{1}{2}(20+15) \times h$

$\Rightarrow$ height = **10 cm**

199.(a) let the rate of painting

= Rs x/metre²

$\therefore$ Length $\times$ breadth $\times$ x

= Rs 120 ...(i)

Length $\times$ (breadth – 4) $\times$ x = Rs 100 ...(ii)

from equation (i) and (ii)

$\frac{\text{breadth}}{\text{breadth}-4} = \frac{120}{100} = \frac{6}{5}$

breadth = 24m

200.(b) Area of corridor

= 100 × 3

= 300 m^2

Carpet length

$= \frac{300 \times 100}{50} = 600$ m

Cost of Carpet = ₹ 15 × 600

= 9000

201. (a) Old expenditure = ₹1000

Increase in area = 50 × 20 m^2

Increase in expenditure

= 50 × 20 × .25 = ₹250

⇒ New expenditure = 1000 + 250

= ₹1250

202. (c) Area of verandah

= (25+7)×(15+7) –25×15

= 704–375 = 329 m^2

Cost of flooring = 329×27.5

= Rs. 9047.5 (app.)

203. (b) $2\pi R_1 = 528$

$\Rightarrow 2 \times \frac{22}{7} \times R_1 = 528$

$\Rightarrow R_1 = 84$ cm

⇒ New Radius $R_1 - 14 = R_2$

$\Rightarrow R_2 = 84 - 14$

$\Rightarrow R_2 = 70$

Area of Road = $\pi (R_1^2 - R_2^2)$

$\Rightarrow = \pi \times 14\,(154)$

⇒ Total expenditure

$= \frac{22}{7} \times 14 \times 154 \times 10 =$ **Rs. 67760**

204. (b) Since the ratio of length and breadth = 3 : 2

Let length of rectangular field = $3x$

Breadth of rectangular filed = $2x$

Perimeter of the field = 80 m

2 (l + b) = 80

2 $(2x + 3x)$ = 80

2 × $5x$ = 80

$x = \frac{80}{10} = 8$

then breadth = $2x$

= 2× 8 = 16 m

205. (c) Since the sides of a rectangular plot are in the ratio = 5 : 4

Let the length of rectangular plot = 5x and the breadth of rectangular filed = 4x

According to question,

Area = 500 m^2

5x × 4x = 500 m^2

$20x^2 = 500$ m^2

$x^2 = \frac{500}{20} = 25$

x = 5

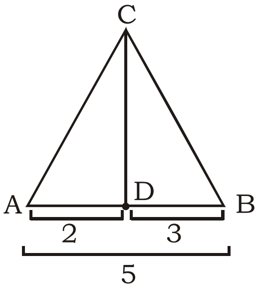
Length = 5x = 5 × 5 = 25 m

Breadth = 4x = 4 × 5 = 20 m

Perimeter of the rectangle

= 2(25 + 20) = 2 × 45 = **90m**

206. (d)



AB = 5 cm

DB = 3 cm

∴ AD = 2 cm

$\frac{ar(\Delta ADC)}{ar(\Delta ABC)} = \left(\frac{AD}{AB}\right)^2$

$= \left(\frac{2}{5}\right)^2 = \frac{4}{25}$

207. (d) Base : Corresponding altitude = 3 : 4

Let the base = $3x$

altitude लम्ब = $4x$

∵ Area of triangle = 1176

$\frac{1}{2} \times 3x \times 4x = 1176$

$x^2 = \frac{1176 \times 2}{3 \times 4} = 196$

$x = 14$

∴ altitude = 4 × 14

= **56 cm**

208. (c) According to question,

Ratio of sides of triangle are

$= \frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

(Take L.C.M of 2, 3, and 4 which is 12)

= 6 : 4 : 3

Now,

$6x + 4x + 3x = 52$

$13x = 52$

$x = 4$

∴ Length of smallest side

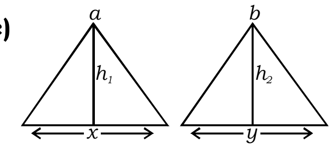
= $3x$ = 3 × 4 = **12 cm**

209. (c) Let diagonals be $2x$ and $5x$

$\frac{A_1}{A_2} = \frac{\frac{1}{2} \times (2x)^2}{\frac{1}{2} \times (5x)^2} = \frac{4}{25}$

⇒ 4 : 25

210. (c)



$\frac{\frac{1}{2} \times h_1 \times x}{\frac{1}{2} \times h_2 \times y} = \frac{a}{b}$

$\frac{h_1}{h_2} \times \frac{x}{y} = \frac{a}{b}, \quad \frac{h_1}{h_2} = \frac{ay}{bx}$

$ay : bx$

211. (a) Ratio of parallel sides

= 5 : 3

Let sides are

$5x$ and $3x$

area = $\frac{1}{2}$ (sum of parallel sides)× perpendicular distance = 1440 m^2

$\frac{1}{2}(5x + 3x) \times 24 = 1440$

$4x \times 24 = 1440$

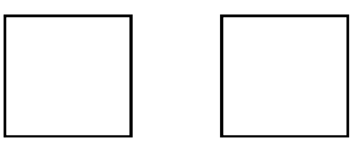
$x = \frac{1440}{4 \times 24} = 15$m

∴ Length of longer side

= 5x

= 5 × 15 = 75 m

212. (c)



a_1 a_2

ATQ, $\frac{a_1{}^2}{a_2{}^2} = \frac{225}{256}$

$\frac{a_1}{a_2} = \sqrt{\frac{225}{256}} = \frac{15}{16}$

Ratio of their perimeters

$= \frac{4a_1}{4a_2} = \frac{a_1}{a_2} = \frac{15}{16}$

⇒ 15 : 16

213. (d) Clearly, 3,4 and 5 form a triplet therefore, consider the triangle, a right triangle

Let the sides are

$3x$, $4x$ and $5x$

perimeter = $3x + 4x + 5x = 12x$

Area of triangle = $\frac{1}{2} \times 3x \times 4x$

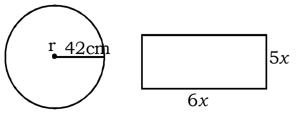
$\frac{1}{2} \times 3x \times 4x = 216$

$x^2 = \frac{216 \times 2}{3 \times 4} = 36$

$x = \sqrt{36} = 6$

$\therefore$ Perimeter = $12 \times 6 = 72$ cm

214. (a)



Perimeter of rectangle = circumference of circular wire

$2(6x + 5x) = 2 \times \frac{22}{7} \times 42$

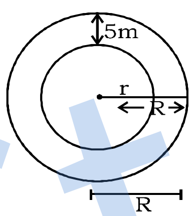
$22x = 2 \times 22 \times 6$

$x = 12$

Clearly, smaller side of rectangle

= 5 × 12 = 60 cm

215. (c)



$\frac{2\pi R}{2\pi r} = \frac{23}{22}$

$\frac{R}{r} = \frac{23}{22}$

Let R = $23x$, r = $22x$

$\therefore$ R – r = 5

$23x - 22x = 5$

$x = 5$

$\Rightarrow$ r = 22 × 5 = 110

Diameter of inner circle = 2r

= 2 × 110 = 220 m

216. (b) Ratio of angles = 3 : 4 : 5

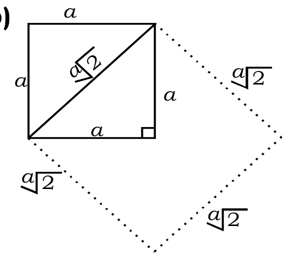
(3 + 4+ 5) unit = 180°

12 units = 180°

1 unit = $\frac{180°}{12}$ = 15°

3	:	4	:	5
×15		×15		×15
45		60		75 → largest angle

217. (b)



Let the side of square = a

$\therefore$ Diagonal = $a\sqrt{2}$

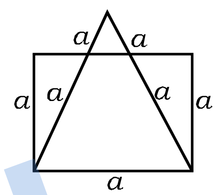
$\left\{\sqrt{a^2 + a^2} = a\sqrt{2}\right\}$

$\frac{\text{Area of square}}{\text{Area of square on diagonal}}$

$= \frac{a^2}{(a\sqrt{2})^2} = \frac{a^2}{a^2 \times 2} = \frac{1}{2}$

= 1 : 2

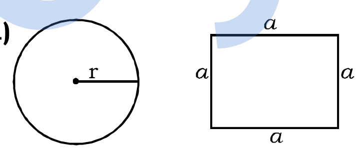
218.(d)



$\frac{\text{area of square}}{\text{area of equilateral triangle}}$

$= \frac{a^2}{\frac{\sqrt{3}}{4}a^2} = \frac{4}{\sqrt{3}} = 4 : \sqrt{3}$

219. (d)



$\pi r^2 = a^2$

$r^2 = \frac{a^2}{\pi}$

$r = \frac{a}{\sqrt{\pi}}$

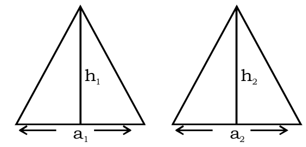
Ratio of perimeter

$= \frac{2\pi r}{4a} = \frac{\pi r}{2a}$

$= \frac{\pi \times \frac{a}{\sqrt{\pi}}}{2a} = \frac{\sqrt{\pi}}{2}$

$= \sqrt{\pi} : 2$

220. (c)



$\frac{\frac{\sqrt{3}}{4}(a_1)^2}{\frac{\sqrt{3}}{4}(a_2)^2} = \frac{25}{36}$

$\frac{a_1}{a_2} = \sqrt{\frac{25}{36}} = \frac{5}{6}$

Ratio of altitudes

$= \frac{\frac{\sqrt{3}}{2}a_1}{\frac{\sqrt{3}}{2}a_2} = \frac{a_1}{a_2} = \frac{5}{6} = 5 : 6$

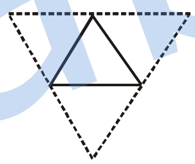
221. (d) Let length = $5x$

$\Rightarrow$ breadth = $\frac{16x - 2 \times 5x}{2} = 3x$

$\therefore$ Required ratio

$= \frac{5x}{3x} = 5 : 3$

222. (c)



When we draw such figures as mentioned in the question the vertex of the old triangle are the mid points of the sides of new triangle and the sides of the old triangle are half of the opposite side.

$\therefore$ Required ratio = 2 : 1

223. (b) $\frac{\text{Circumference}}{\text{Area}} = \frac{2\pi r}{\pi r^2}$

$= \frac{2}{r} = \frac{2}{3}$

224. (a) Ratio of area

= (Ratio of radius)²

	A		B		C
Radius	4	:	2	:	1
Area	16	:	4	:	1

225. (a) Let the sides be

3x, 4x, 5x and 6x

$\Rightarrow$ 18x → 72, x → 4

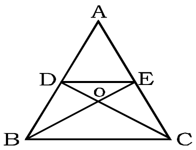
$\Rightarrow$ Greatest side

= 6 × 4 = 24 cm

226. (b) Ratio of circumference

= Ratio of radius = 3 : 4

227. (a)



As D and E are mid-points

$\Rightarrow$ DE| |BC

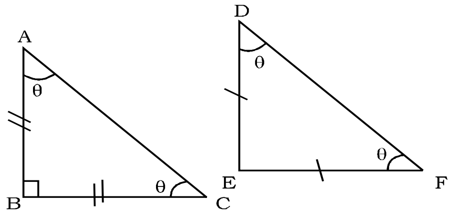
$\Rightarrow \triangle$ ODE ~ $\triangle$ BOC

and also $\frac{DE}{BC} = \frac{1}{2}$

(as D and E are mid-points)

$\Rightarrow \frac{ar\triangle ODE}{ar\triangle OBC} = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

228. (c)



The given angle is same let vertical angle = θ

($\therefore$ $\triangle$ABC and $\triangle$DEF are isosceles triangles)

$\Rightarrow$ When two angles are equal then third angle is also equal

$\therefore \triangle ABC \sim \triangle DEF$

$\triangle$ABC is simmiler to $\triangle$DEF

$\therefore \frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$

$= \left(\frac{\text{side of } \triangle ABC}{\text{side of } \triangle DEF}\right)^2$

$\Rightarrow \sqrt{\frac{1}{4}} = \frac{\text{side of } \triangle ABC}{\text{side of } \triangle DEF}$

$= \frac{\text{side of } \triangle ABC}{\text{side of } \triangle DEF} = \frac{1}{2}$

229. (a) Let the sides be $3x$, $3x$ and $4x$

$\Rightarrow$ Area $= \frac{(4x)^2}{4}\sqrt{4(3x)^2 - (4x)^2}$

$= 4x^2\sqrt{36x^2 - 16x^2}$

$= 4x^2\sqrt{20x^2}$

$= 8x^3\sqrt{5} = 8\sqrt{5}$

$= x^3 = 1 = x = 1$

$\therefore$ 3rd side = 3 × 1 = 3 units

230. (c) 3,4 and 5 from triplet

Let the sides be 3x,4x and 5x

$\Rightarrow \frac{1}{2} \times 3x \times 4x = 72$

$\Rightarrow 6x^2 = 72$

$\Rightarrow x^2 = 12 \Rightarrow x = 2\sqrt{3}$

$\therefore$ Smallest side $= 3 \times 2\sqrt{3} = 6\sqrt{3}$

231. (b) Let the sides be 3x, 4x and 5x

$\Rightarrow$ area $= \frac{1}{2} \times 3x \times 4x = 72$

$\Rightarrow 6x^2 = 72$

$x^2 = 12$

$x = 2\sqrt{3}$

$\Rightarrow$ Perimeter of equilateral $\triangle$

$= 12 \times 2\sqrt{3} = 24\sqrt{3}$ units

Side of $\triangle = \frac{24\sqrt{3}}{3}$

$= 8\sqrt{3}$ units

area of $\triangle = \frac{\sqrt{3}}{4} \times \left(8\sqrt{3}\right)^2$

$= \frac{\sqrt{3}}{4} \times 64 \times 3 = 48\sqrt{3}$ unit²

232. (a) Let the side of square = a

$\therefore$ Side of equilateral $\triangle = \sqrt{2}$ a

Required ratio

$= \frac{\frac{\sqrt{3}}{4}\left(\sqrt{2}a\right)^2}{a^2}$

$= \frac{\sqrt{3}}{4} \times 2 = \sqrt{3} : 2$

233. (b) Ratio of area

= (Ratio of side)²

$\frac{ar\triangle ABC}{ar\triangle DEF} = \left(\frac{10}{8}\right)^2 = 25 : 16$

234. (a) $\frac{\pi r_1^2}{\pi r_2^2} = \frac{4}{7}$

$\frac{r_1^2}{r_2^2} = \frac{4}{7}$

$\frac{r_1}{r_2} = \sqrt{\frac{4}{7}} = \frac{2}{\sqrt{7}} = \mathbf{2 : \sqrt{7}}$

235. (c) $\frac{\pi(5)^2 - \pi(3)^2}{\pi(5)^2} = \frac{(5)^2 - (3)^2}{(5)^2} = \frac{16}{25}$

$\Rightarrow$ **16 : 25**

236.(a) Let side of square = a

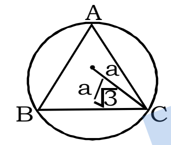
Radius of smaller circle $= \frac{a}{2}$

Radius of of larger circle $= \frac{\sqrt{2}a}{2}$

Ratio $= \frac{\pi\left(\frac{a}{2}\right)^2}{\pi\left(\frac{\sqrt{2}a}{2}\right)^2} = \frac{\frac{a^2}{4}}{\frac{2a^2}{4}} = \frac{1}{2}$

$\Rightarrow$ **1 : 2**

237. (c)



Circum radius $= \frac{side}{\sqrt{3}} = \frac{a}{\sqrt{3}}$

Equilateral $\triangle$

Required ratio $= \frac{\frac{\sqrt{3}}{4}a^2}{\pi\left(\frac{a}{\sqrt{3}}\right)^2} = \frac{3\sqrt{3}}{4\pi}$

$=$ **$3\sqrt{3} : 4\pi$**

238. (d) 2(l + b) = 4a

(a = side of square)

2(2 + 1) = 4a

2 × 3 = 4a

$a = \frac{3}{2}$

Required ratio

$= \frac{l \times b}{a^2} = \frac{1 \times 2}{\left(\frac{3}{2}\right)^2} = \frac{2 \times 4}{9} = \frac{8}{9} =$ **8: 9**

239. (c) 2(l + b) = 3a

$\therefore$ (a =side of equilateral triangle)

Let (b = a)

$\Rightarrow$ 2(l + a) = 3a

2(l + a) = 3a

2l + 2a = 3a

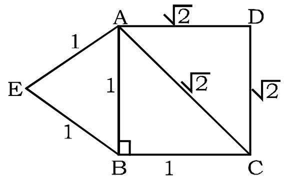
2l = a

Required Ratio $= \frac{l \times b}{\frac{\sqrt{3}}{4}a^2} = \frac{\frac{a}{2} \times a}{\frac{\sqrt{3}}{4}a^2}$

$= \frac{a^2}{2} \times \frac{4}{\sqrt{3}a^2}$

$= \frac{2}{\sqrt{3}} =$ **$2 : \sqrt{3}$**

240. (c) Let AB = 1, BC = 1



$\therefore$ AC = $\sqrt{1^2+1^2}$ = $\sqrt{2}$

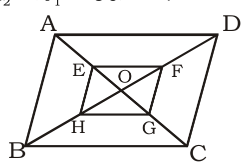
(using pythagoras)

$$\frac{ar(\Delta ABE)}{ar(\Delta ACD)} = \frac{\frac{\sqrt{3}}{4}(1)^2}{\frac{\sqrt{3}}{4}(\sqrt{2})^2} = \frac{1}{2} = \mathbf{1 : 2}$$

241. (c) By using result, $R_1\theta_1 = R_2\theta_2$

$$\frac{R_1}{R_2} = \frac{\theta_2}{\theta_1} = \frac{75°}{60°} = \frac{5}{4} = 5 : 4$$

242. (c)



In Δ OBC,

H and G are the midpoints of OB and OC

$\therefore$ HG = $\frac{1}{2}$BC

Similarly, FG = $\frac{1}{2}$CD

and EF = $\frac{1}{2}$AD,

HE = $\frac{1}{2}$AB

on adding,

HE + HG + FG + EF

= $\frac{1}{2}$(AB + BC + CD + AD)

Perimeter of EFGH.

= $\frac{1}{2}$ × perimeter of ABCD

$$\frac{\text{perimeter of EFGH}}{\text{perimeter of ABCD}} = \frac{1}{2}$$

243. (c) Old circumference = 4π

2πr = 4π

r = $\frac{4\pi}{2\pi}$ = 2cm

Old area = π(2)² = 4π cm²

New circumference = 8π

2πR = 8π

R = $\frac{8\pi}{2\pi}$ = 4cm

New area = 16π cm²

Option (c) is the answer

($\because$ area is quadruples)

244. (c)

Length 4 → 5
Breadth 5 → 4
area 20 → 20

area remains unchanged

245. (d) Area of circle

= π(5)² = 25π

Circumference of circle

= 2π(5) = 10π

% = $\frac{25\pi}{10\pi}$ × 100 = 250%

246. (d) According to question,

Circumference of a circle

= area of circle

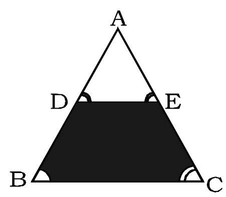
2πr = πr²

r = 2

$\therefore$ Diameter of circle

= 2r = 2 × 2 = 4

247. (c)



$\therefore$ D and E are the mid points of sides AB and AC

$\therefore$ DE||BC (By mid point theorem)

also DE = $\frac{1}{2}$ BC

ΔADE ~ ΔABC

$\begin{Bmatrix} \angle ADE = \angle ABC \\ \angle AED = \angle ACB \end{Bmatrix}$

$$\frac{ar(ADE)}{ar(ABC)} = \left(\frac{DE}{BC}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

$$\therefore \frac{ar(DECB)}{ar(ABC)} = \frac{3}{4}$$

Percentage of ar (DECB)

= $\frac{3}{4}$ × 100 = 75%

248. (d) If circumference of circle is reduced by 50% then radius is reduced by 50%

50% = $\frac{1}{2}$ → decrement / original

	radius	Area
Original	2	4
New	1	1

(4 → 1: −3)

(π is constant)

Reduction in area

= $\frac{3}{4}$ × 100 = 75%

249. (d) Increase in area

= 25 + 25 + $\frac{25 \times 25}{100}$

use formula ($x + y + \frac{xy}{100}$)

= 50 + 6.25 = 56.25%

250. (a) Increase in area

= 50 + 50 + $\frac{50 \times 50}{100}$ = 100 + 25

= 125%

251. (c) Increase in altitude = 10%

= $\frac{1}{10}$ → Increment / original

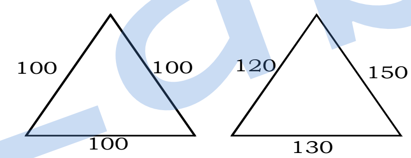
	altitude	base
Old	10	11
New	11	10

(11 → 10: −1)

Area no change due to decrease in base

= $\frac{1}{11}$ × 100 = $9\frac{1}{11}$%

252. (b)



Perimeter of equilateral triangle = 100 + 100 + 100 = 300

Perimeter of New triangle

= 120 + 150 + 130 = 400

% increase = $\frac{100}{300}$ × 100

= $33\frac{1}{3}$%

253. (b)

Length 5 → 3
breadth 5 → 3
Area 25 → 9

% decrease = $\frac{25 - 9}{25}$ × 100 = 64%

254. (a)

Length 5 → 8
Breadth 8 → 5
Area 40 → 40

⇒ % Decrease

= $\frac{8 - 5}{8}$ × 100 = $37\frac{1}{2}$%

255. (c) Let the breadth = x cm

$\Rightarrow$ Length = $(x + 20)$ cm

According to the question,

$x(x + 20) = (x + 10)(x + 5)$

$\Rightarrow x^2 + 20x = x^2 + 15x + 50$

$\Rightarrow 5x = 50$

$\Rightarrow x = 10$

$\Rightarrow$ Area = $10(10 + 20) = 300$ m²

256. (c)

Length	20	$\rightarrow$	21
Breadth	50	$\rightarrow$	49
Area	1000	$\rightarrow$	1029

% error = $\frac{1029 - 1000}{1000} \times 100 = 2.9\%$

257. (d)

Length	10	$\rightarrow$	13
Breadth	10	$\rightarrow$	12
Area	100	$\rightarrow$	156

% increase in area

$= \frac{156 - 100}{100} \times 100 = 56\%$

258. (d) $40\% = \frac{4}{10} = \frac{2}{5}$

	Side	Surface area	
40%	5	$(5)^2 = 25$	24
	7	$(7)^2 = 49$	

% increase = $\frac{24}{25} \times 100 = 96\%$

Alternate:-

Percentage increase in surface are

$= 40 + 40 + \frac{40 \times 40}{100}\%$

$= 80 + 16 = 96\%$

% effect using $x + y + \frac{xy}{100}$

259. (a) percentage increase in area

$= \left(8 + 8 + \frac{8 \times 8}{100}\right)$

$= 16 + 0.64 =$ **16.64%**

260. (c) Percentage increase in area

$= 100 + 100 + \frac{100 \times 100}{100} = 300\%$

Alternate:-

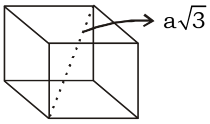
L	B	Area
1	1	1
2	2	4

(+3)

Percentage increase

$= \frac{3}{1} \times 100 = 300\%$

261. (a) Let the side of cube = a cm



Diagonal of cube

$= a\sqrt{3}$ cm

$a\sqrt{3} = \sqrt{12}$

on squaring

$a^2(3) = 12$

$a^2 = 4$

$a = 2$cm

Volume of cube

$= a^3 = 2^3 = 8$ cm

262. (c) Number of cubes

$= \frac{(15)^3}{(3)^3} =$ **125**

263. (b) Let $l = 9x$, $h = 3x$, $b = x$

$l \times b \times h = 216 \times 1000$

(1 litre = 1000 cm³)

$9x \times 3x \times x = 216000$

$27x^3 = 216000$

$x^3 = 8000$

$x = 20$

$l = 180$ cm = 18 dm

264. (b) Volume of cuboid

= 2 × volume of cube

$\Rightarrow l \times b \times h = 2 \times (\text{side})^3$

$\frac{9 \times 8 \times 6}{2} = (\text{side})^3$

side = $\sqrt[3]{6 \times 6 \times 6} = 6$ cm

Total surface area of cube

$= 6\ (\text{side})^2$

$= 6\ (6)^2 = 6 \times 36 = 216$ cm²

265. (d) Length of largest bomboo

$= \sqrt{5^2 + 4^2 + 3^2} = \sqrt{25 + 16 + 9}$

$= \sqrt{50} =$ **$5\sqrt{2}$ m**

266. (a) The external dimensions of the box are = l = 20 cm, b = 12 cm, h = 10 cm

External volume of the box

$= 20 \times 12 \times 10 = 2400$ cm³

Thickness of the wood = 1 cm

Internal length

= 20 – 2 = 18 cm

Internal breadt

= 12 – 2 = 10 cm

Internal height

= 10 – 2 = 8 cm

Internal volume of the box

$= 18 \times 10 \times 8 = 1440$ cm³

Volume of the wood

= (2400 – 1440) cm³ = 960cm³

267. (c) The number of cubes will be least if each cube will be of maximum edge

$\therefore$ Maximum possible length

= HCF of 6, 9, 12 = 3

Volume of cube = $3 \times 3 \times 3$ cm³

$\therefore$ Number of cubes

$= \frac{6 \times 9 \times 12}{3 \times 3 \times 3} = 24$

268. (b) volume of the cistern

$= (330 - 10) \times (260 - 10) \times (110 - x) = 8000 \times 1000$

(where x = thickness of bottom)

$x = 110 - 100 = 10$ cm

269. (a) Let the length, breadth and height be l, b, h respectively

$\Rightarrow lb = x$

$bh = y$

$lh = z$

$\Rightarrow l^2b^2h^2 = xyz$

$(lbh)^2 = xyz$

$\Rightarrow v^2 = xyz$

270. (d) The diameter of sphere

= side of cube

= 7 cm

Radius (r) = $\frac{7}{2}$ cm

Volume of sphere = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times \frac{7}{2}$

= 179.67 cm³

271. (a) Volume of the box

$= l \times b \times h$

$= (40 - 8) \times (15 - 8) \times 4$

$= 32 \times 7 \times 4$

= 896 cm³

272. (d) Let the three sides of the cuboid be l, b and h

$\Rightarrow lb = bh = hl = 12$

$\Rightarrow l^2b^2h^2 = 12 \times 12 \times 12 = 1728$

$\Rightarrow lbh = \sqrt{1728} = 12\sqrt{12}$

$= 24\sqrt{3}$ cm³

273. (b) Area of floor

$\Rightarrow$ 3 × 4 = 12 m^2

Height $\Rightarrow$ 3 m

$\therefore$ Area of walls of room

$\Rightarrow$ (Perimeter of floor) × height of room

$\Rightarrow$ $2(l + b) \times h$

$\Rightarrow$ l = length = 4 m

b = breadth = 3 m

h = height = 3 m

$\therefore$ Area of walls

$\Rightarrow 2(4 + 3) \times 3 = 42\ m^2$

Area of paintaed part = 42 m^2 + 12m^2 = 54 m^2

274. (a) Let length = l,

breadth = b, height = h

given that

$(l + b + h) = 12$ cm

= total surface area of box

$= 2(lb + bh + hl)$

$\Rightarrow$ 94 m^2 (given)

$(l + b + h)^2$

$\Rightarrow l^2 + b^2 + h^2 + 2(lb + bh + hl)$

$(12)^2 = l^2 + b^2 + h^2 + 94$

$144 - 94 \Rightarrow l^2 + b^2 + h^2$

$\Rightarrow$ **$50 = l^2 + b^2 + h^2$**

diagonal of box = $\sqrt{l^2 + b^2 + h^2}$

$\therefore$ Length of longest rod that can be put inside the box

$= \sqrt{l^2 + b^2 + h^2} = 5\sqrt{2}$ cm

275. (c) Let breadth = b m

$\therefore$ length of room = 2b m

$(l = 2b)$

Height = 11 m

Area of four walls of room

$\Rightarrow$ 660 m^2 (given)

$2(l + b) \times h = 660$

$2(2b + b) \times 11 = 660$

$3b \times 22 = 660$

b = 10

$\therefore$ Breadth = 10 m

Length = 20 m

Area of floor = $l \times b$

Length × breadth

20 × 10 = 200 m^2

276. (d) Side of cube (a)

$= \frac{8\sqrt{3}}{\sqrt{3}} = 8$ cm

$\Rightarrow$ Total surface area = $6(a)^2$

$= 6 \times 8^2 = 384 cm^2$

277. (b) Whole surface area of cuboid = 2(whole surface area of cube) – 2 × area of one face

($\because$ two faces of the two cubes are not visible now)

$\Rightarrow$ Required area = $12a^2 - 2a^2 = 10a^2$

$= 10 \times 6^2 = 360\ cm^2$

278. (b) Let the increase in level

= x m

$\Rightarrow \left(1000 \times 1000 \times \frac{2}{100}\right) \times \frac{1}{2} = 100 \times 10 \times x$

$\Rightarrow x = 10$m

279. (d) Sides of parallelopiped are in ratio = 2 : 4 : 8

Let length = 2 units

breadth = 4 units

Height = 8 units

Let the side of cube = a unit

According to question

volume of cube = volume of parallelopiped

$a^3 = 2 \times 4 \times 8$

$a^3 = 64$

$a = \sqrt[3]{64} = 4$ units

$\frac{\text{Surface area of parallelopiped}}{\text{Surface area of cube}}$

$= \frac{2(lb + bh + hl)}{6a^2} = \frac{2(8 + 32 + 16)}{6(4)^2}$

$= \frac{7}{6} = 7 : 6$

280. (c) Let length = 1cm

breadth = 2 cm,

height = h cm

$2(lb + bh + hl) = 22$

$2(2 + 2h + h) = 22$

$2 + 3h = 11$

$3h = 9$

h = 3 cm

$D = \sqrt{1^2 + 2^2 + 3^2} = \sqrt{1 + 4 + 9}$

$= \sqrt{14}$ cm

281. (d) $\sqrt{l^2 + b^2 + h^2} = 15$

$l^2 + b^2 + h^2 = 225$ ....(i)

$\therefore\ l + b + h = 24$

$(l + b + h)^2 = 576$

$\Rightarrow l^2 + b^2 + h^2 + 2(lb + bh + hl)$

$= 225 + 2(lb + bh + hl) = 576$

$2(lb + bh + hl) =$ **351 cm²**

282. (c) Total surface area of cube

$= 6(\text{side})^2$

$6(\text{side})^2 = 96$

$(\text{side})^2 = \frac{96}{6} = 16$

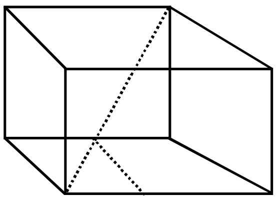
side = $\sqrt{16}$ = 4 cm

Volume of the cube

$= (\text{side})^3$

$= (4)^3 =$ **64 cm³**

283.(b)



Diagonal = $35\sqrt{3}$

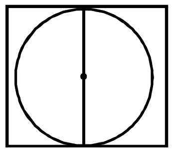
$\therefore$ The length of largest rod

= Diagonal = side $\sqrt{3}$

Side $\sqrt{3} = 35\sqrt{3}$

side $= \frac{35\sqrt{3}}{\sqrt{3}} = 35$

side of cube = 35



Diameter of the sphere

= side of the cube

2 × radius = side

radius = $\frac{35}{2}$ cm

Surface area of the sphere = $4\pi r^2$

$= 4 \times \frac{22}{7} \times \frac{35}{2} \times \frac{35}{2}$

= **3850 m²**

284. (d) volume of air in room

= 204 m^3

(area of floor) × height = 204

$\therefore$ volume = area of base × height

(Area of floor) × 6 = 204

Area of floor = $\frac{204}{6}$ = 34 m^2

285. (a) volume of all three cube
$= 4^3 + 5^3 + 6^3$
$= 64 + 125 + 216\ cm^3 = 405\ cm^3$
Now, 62 cm^3 is lost due to improper handling.
$\therefore$ Volume of new cube
$= 405 - 62 = 343$
$(\text{side of new cube})^3 = 343$
Side of new cube $= \sqrt[3]{343} = 7$
Total surface area of new cube
$= 6\ (\text{side})^2 = 6 \times (7)^2$
$= 6 \times 49 =$ **294 cm²**

286. (b) Volume = 20 m^3
$= 20 \times (100)^3\ cm^3$
Volume of one brick
$= (25 \times 12.5 \times 8)\ cm^3$
$\therefore$ Required number of bricks
$$= \frac{20 \times 100 \times 100 \times 100}{25 \times 12.5 \times 8} = 8000$$

287. (b) Ratio of length : breadth
$= 5 : 3$
Total surface area of parallelopiped = 558 cm^2
$2\ (lb + bh + hl) = 558$
$2(5x \times 3x + 3x \times 6 + 6 \times 5x)$
$= 558$
$2\ (15x^2 + 18x + 30x) = 558$
$15x^2 + 48x = 279$
$15x^2 + 48x - 279 = 0$
On solving, $x = 3$
$\therefore$ Length $= 5 \times 3$
$= 15\ cm = \frac{15}{10} =$ **1.5 dm**

Alternate:-
Take help from the options
Convert all options in cm. 90, 15, 100, 150 then divide all by 5 (because we have to find length) 18, 3, 20, 30. Put all these values one by one

288. (c) Let length $= 3x$,
breadth $= 4x$
height $= 6x$
$3x \times 4x \times 6x = 576$
$$x^3 = \frac{576}{3 \times 4 \times 6} = 8$$
$x = \sqrt[3]{8} = 2$ cm
$\therefore$ Length $= 3 \times 2 = 6$cm
Breadth $= 4 \times 2 = 8$ cm,
Height $= 6 \times 2 = 12$ cm
Total surface area
$= 2\ (lb + bh + hl)$
$= 2\ (6 \times 8 + 8 \times 12 + 12 \times 6)$
$= 2\ (48 + 96 + 72)$
$= 2 \times 216 =$ **432 cm²**

289. (d) We know that
A parallelopiped has vertices (v) = 8
edge (e) = 12
face (f) = 6
Put into equation $(v - e + f)$
$\Rightarrow 8 - 12 + 6 \Rightarrow 2$

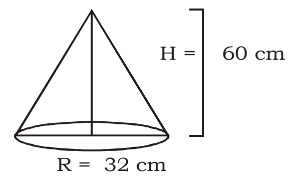
290. (b) According to the question.
$$1\ dm = \frac{1}{10}\ m$$
Let depth of the hole = d
$$\therefore 48\ m \times 31.5 \times \frac{6.5}{10}\ m$$
$= 27 \times 18.2 \times d$
$d = 2m$

291. (c) $2.1\ m \times 1.5\ m \times h = 630$ lt
$$\frac{21}{10} m \times \frac{15}{10} m \times h = \frac{630}{1000} m^3$$
$$\left[\begin{array}{l} \because 1\ m^3 = 1000 lt \\ 1000\ cm^3 = 1 lt \end{array}\right]$$
$$h = \frac{1}{5} m = 0.20 \text{ metre}$$

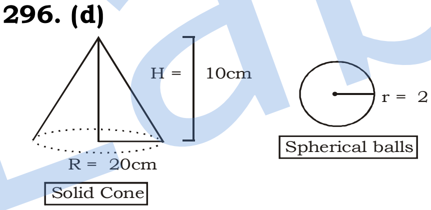
292. (d) Number of cubes $= \frac{8 \times 4 \times 2}{2 \times 2 \times 2} = 8$

293. (a) When we change shape of a solid figure, volume remains constant
$\therefore$ Volume of hemisphere
= Volume of cone
$$\frac{2}{3} \pi R^3 = \frac{1}{3} \pi R^2 h$$
$\therefore 2R = h$

294. (d) According to question,
Let the radius of sphere
= r cm
$4\pi (r + 2)^2 - 4\pi r^2 = 352$
In such type of questions take help from the options to save your valuable time
$$4\pi \left\{(r+2)^2 - r^2\right\} = 352$$
$$4\pi \left\{r^2 + 4 + 4r - r^2\right\} = 352$$
$$\pi (1 + r) = \frac{352}{16} = 22$$
Take r = 6,
$$\frac{22}{7} \times (1 + 6) = \frac{22}{7} \times 7 = 22$$
Then option (d) is the right answer.

295(d)


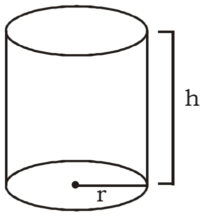
We have to find the slant height
Take ratio of H and R
$= \cancel{60} : \cancel{32}$
$15 : 8$
$L = \sqrt{15^2 + 8^2} = 17$
$= 17 \times 4 = 68$ cm
Cost of painting = Surface area of cone × 35 = π R L × 35
$$= \frac{22}{7} \times \frac{32 \times 68}{10000} \times 35$$
= **Rs. 23.94 (approx)**

296. (d)


Let the spherical balls made = 'x'
According to question,
Volume of cone $= x \times$ volume of sphere
$$\frac{1}{3} \pi R^2 H = x \times \frac{4}{3} \pi r^3$$
$(20)^2 \times 10 = x \times 4 \times (2)^3$
$x =$ **125**

297. (d) Radius of tank
$$r = \frac{35}{2}\ cm$$
Let initial height = H
Final height = h
According to question,
$$\pi \left(\frac{35}{2}\right)^2 \times H - \pi \left(\frac{35}{2}\right)^2 h = 11000\ cm^3$$
$$\pi \left(\frac{35}{2}\right)^2 \times (H - h) = 11000$$
$$H - h = \frac{11000 \times 2 \times 2 \times 7}{35 \times 35 \times 22} = \frac{80}{7}$$
$$= 11\frac{3}{7}\ cm$$

298. (a)



According to question,

$2\pi r = 6\pi$

$r = 3$ cm

Height of cylinder

= diameter = 2×r

= 2 × 3 = 6cm

Volume of water

$= \pi r^2 h = \pi (3)^2 \times 6 = \mathbf{54\pi\ cm^3}$

299. (b) Volume of the cone

$= \frac{1}{3}\pi(15)^2 \times 108 \quad cm^3$

Volume of the cylinder

$= \pi \times r^2 \times 9 \quad cm^3$

According to question,

$\pi \times r^2 \times 9 = \frac{1}{3}\pi \times 15 \times 15 \times 108$

$r^2 = \frac{5 \times 15 \times 108}{9} = 900$

$r = \sqrt{900} = 30$

Diameter of base

= 2r = 2 × 30 = 60 cm

300. (d) Volume of new solid sphere

$= \frac{4}{3}\pi\left(\frac{6}{2}\right)^3 + \frac{4}{3}\pi\left(\frac{8}{2}\right)^3 + \frac{4}{3}\pi\left(\frac{10}{2}\right)^3$

$\frac{4}{3}\pi r^3 = \frac{4}{3}\pi\left[(3)^3 + (4)^3 + (5)^3\right]$

$r^3 = 216,\ r = 6$ cm

∴ Diameter of the new sphere

= 2 × 6 = 12 cm

301. (b) $l = 2.5$ km

Area of base = 1.54 km²

$\pi r^2 = 1.54$

$r^2 = \frac{1.54 \times 7}{22}$

$r = \sqrt{\frac{1.54 \times 7}{22}} = 0.7$ km

We know that

$l^2 = r^2 + h^2$

$h^2 = \sqrt{l^2 - r^2}$

$= \sqrt{2.5^2 - 0.7^2}$

$= \sqrt{5.76} = 2.4$ km

302. (c) Radius $= \frac{\text{diameter}}{2}$

$= \frac{19.2}{2} = 9.6$ m

Height = 2.8

$l^2 = r^2 + h^2 = 9.6^2 + 2.8^2$

= 92.16 + 7.84 = 100

$l = \sqrt{100} = 10$ m

Area of the canvas $= \pi r l$

$= \frac{22}{7} \times 9.6 \times 10$

= **301.7**

303. (c) External radius R = 4 cm

Internal radius r = 3cm

Volume of iron used

$= \pi R^2 h - \pi r^2 h$

$= \pi h (R^2 - r^2)$

$= \pi h (R + r)(R - r)$

$= \frac{22}{7} \times 20 \times (4+3) \times (4-3)$

$= \frac{22}{7} \times 20 \times 7 \times 1$

= 440 cm³

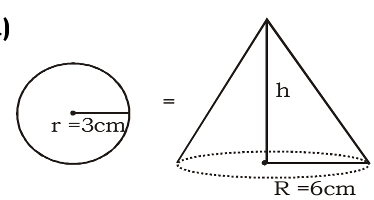
304. (c) Volume of Sphere

= volume of displaced water

$\frac{4}{3}\pi \times 2 \times 2 \times 2 = \pi \times 4 \times 4 \times h$

$h = \mathbf{\frac{2}{3}\ cm}$

305.(d)



Volume of cone

= volume of sphere

$\frac{1}{3}\pi R^2 h = \frac{4}{3}\pi r^3$

$\frac{1}{3}\pi \times 6 \times 6 \times h$

$= \frac{4}{3}\pi \times 3 \times 3 \times 3$

h = 3 cm

306. (b) Volume of a cone $= \frac{1}{3}\pi r^2 h$

$\frac{1}{3}\pi r^2 (24) = 1232$ cm ²

$r^2 = \frac{1232 \times 3 \times 7}{24 \times 22}$

$r^2 = 7 \times 7$

$r = \sqrt{7 \times 7} = 7$ cm

$l = \sqrt{r^2 + h^2} = \sqrt{7^2 + 24^2} = \sqrt{625}$

= 25

Curved surface area $= \pi rl$

$= \frac{22}{7} \times 7 \times 25$

= 550 cm²

307. (d) Volume of a sphere

$= \frac{88}{21} \times (14)^3$

$= \frac{4}{3} \times \frac{22}{7} \times (14)^3 \left\{\frac{4}{3}\pi r^3\right\}$

Radius = 14

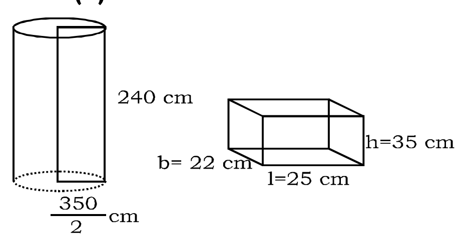
Curved surface area of sphere

$= 4\pi\,(\text{radius})^2$

$= 4 \times \frac{22}{7} \times 14 \times 14$

= 2464 cm²

308. (a) 1 dm = 10 cm



$x \times$ volume of 1 tin

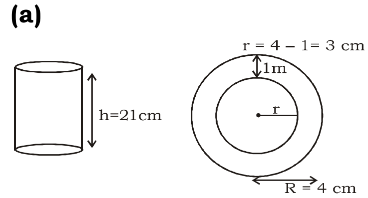
= volume of cylinder

$\Rightarrow x \times (25 \times 22 \times 35)$

$= \frac{22}{7} \times \frac{350}{2} \times \frac{350}{2} \times 240$

$x = 1200$

309. (a)



Volume of hollow iron pipe

$= \pi\{R^2 - r^2\} \times h$

$= \pi\{4^2 - 3^2\} \times 21$

$= \frac{22}{7} \times 7 \times 21 \qquad = 22 \times 21$

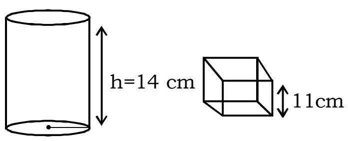
$= 462\ cm^3$

Now $1\ cm^3 = 8g$

$462\ cm^3 = 8 \times 462\ g$

$= 3696\ g = 3.696 kg$

310. (b)



Volume of the cylinder = volume of cube

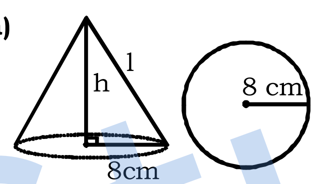
$\pi r^2 h = (\text{side})^3$

$\frac{22}{7} \times r^2 \times 14 = 11 \times 11 \times 11$

$r^2 = \frac{11 \times 11 \times 11}{22 \times 2} = \frac{121}{4}$

$r = \frac{11}{2}$ cm = 5.5 cm

311. (a)



Volume of cone

= volume of sphere

$\frac{1}{3}\pi (8)^2 \times h = \frac{4}{3}\pi (8)^3$

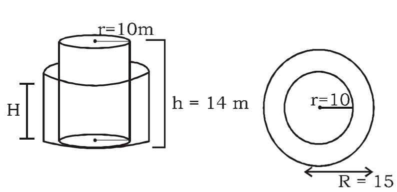
$8 \times 8 \times h = 4 \times 8 \times 8 \times 8$

h = 32 cm

Slant height = (l)

$\sqrt{r^2 + h^2} = \sqrt{8^2 + 32^2} = \sqrt{64 + 1024} = 8\sqrt{17}$

312.(c)



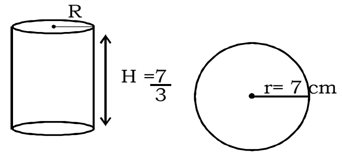
Volume of well

= volume of embankment

$\pi (10)^2 \times 14 = \pi\{15^2 - 10^2\} \times H$

$H = \frac{100 \times 14}{125} = 11.2$ m

313. (b)



Volume of sphere = volume of cylinder

$\frac{4}{3}\pi(7)^3 = \pi(R)^2 \times \frac{7}{3}$

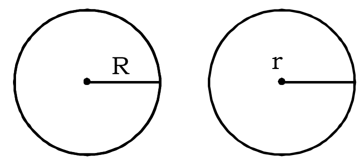
$R^2 = 4 \times 7 \times 7 = 2 \times 2 \times 7 \times 7$

$R = \sqrt{2 \times 2 \times 7 \times 7} = 2 \times 7 = 14$ cm

Diameter of base of cylinder

= 2R = 2 × 14 = 28 cm

314. (b)



ATQ

R + r = 10

$(R + r)^2 = 100$

$R^2 + r^2 + 2Rr = 100$

$R^2 + r^2 = 100 - 2Rr \qquad \ldots(i)$

$\frac{4}{3}\pi R^3 + \frac{4}{3}\pi r^3 = 880$

$\frac{4}{3}\pi\left(R^3 + r^3\right) = 880$

$R^3 + r^3 = \frac{880 \times 3}{\pi \times 4} = \frac{880 \times 3 \times 7}{22 \times 4}$

$(R + r)(R^2 + r^2 - Rr) = 210$

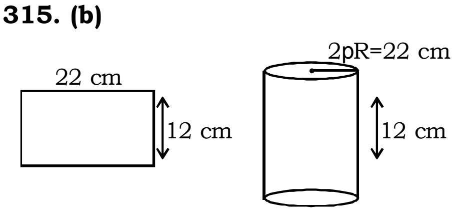
$10 \times (100 - 2Rr - Rr) = 210$

100 – 3Rr = 21

3Rr = 100 – 21 = 79

$Rr = \frac{79}{3} = 26\frac{1}{3}$

315. (b)



∴ Cylinder is folded along the length of rectangle

$\therefore 2\pi R = 22$

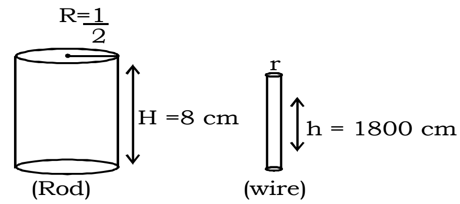
$R = \frac{22}{2\pi} = \frac{22 \times 7}{2 \times 22} = \frac{7}{2}$ cm

Volume of the cylinder = $\pi R^2 H$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 12$

$= 22 \times 7 \times 3 = 462\ cm^3$

316. (b)



Volume of wire

= volume of Rod

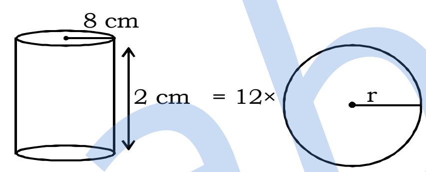
$\pi r^2 h = \pi R^2 h$

$\Rightarrow \frac{1}{4} \times 8 = r^2 \times 1800$

$r^2 = \frac{2}{1800} = \frac{1}{900}$

$r = \sqrt{\frac{1}{900}} = \frac{1}{30}$

317. (b)



Volume of cylinder = 12 × volume of sphere

$\pi (8)^2 \times 2 = 12 \times \frac{4}{3}\pi r^3$

$r^3 = \frac{8 \times 8 \times 2 \times 3}{12 \times 4}$

$r = \sqrt{2 \times 2 \times 2} = 2$ cm

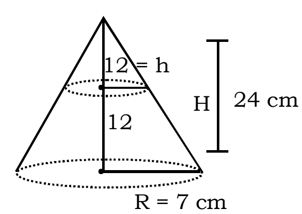
r = 2 cm

d = 4cm

318. (c) $2\pi R - 2\pi r = 5$

$(R - r) = \frac{5}{2\pi}$

319. (b)



Volume of bigger cone

$= \frac{1}{3} \times \pi \times (7)^2 \times 24$

$= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24$

$= 22 \times 7 \times 8 = 1232\ cm^3$

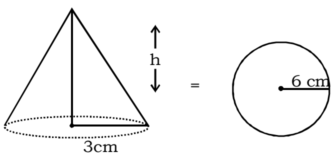
$$\frac{\text{volume of smaller cone}}{\text{volume of bigger cone}} = \frac{h^3}{(H)^3}$$

$$\frac{\text{Volume of smaller cone}}{1232} = \frac{12^3}{24^3}$$

volume of smaller cone = 154 cm^3

∴ When the cone is cut in between then the ratio of volume of smaller cone to the bigger one is always equal to the ratio of the cubes of their heights or radii

320. (b)



$$n = \frac{\text{Volume of sphere}}{\text{volume of cone}}$$

$$= \frac{\frac{4}{3}\pi(6)^3}{\frac{1}{3}\pi(3)^2 \times 4} = 24$$

321. (c) Height of cylinder

= Breadth of tin foil

⇒ Circumference of the base of cylinder

= Length of the foil

= 22 cm

$\Rightarrow 2\pi r = 22$

$$r = \frac{22 \times 7}{22 \times 2} = \frac{7}{2} \text{ cm}$$

$$\text{Volume} = \pi r^2 h = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 16$$

= 616cm^3

322. (d) $\pi r^2 = 770$

$$\Rightarrow r^2 = \frac{770 \times 7}{22}$$

$\Rightarrow r = 7\sqrt{5}$ cm

and $\pi r l = 814$

$$\Rightarrow l = \frac{814 \times 7}{22 \times 7\sqrt{5}} = \frac{37}{\sqrt{5}}$$

$l^2 = h^2 + r^2$

$$= \frac{37 \times 37}{5} = h^2 + 245$$

$$\Rightarrow h^2 = \frac{1369}{5} - 245 = \frac{144}{5}$$

$$\Rightarrow h = \frac{12}{\sqrt{5}}$$

$$\text{Volume} = \frac{1}{3}\pi r^2 h$$

$$= \frac{1}{3} \times \frac{22}{7} \times 7\sqrt{5} \times 7\sqrt{5} \times \frac{12}{\sqrt{5}}$$

$= 616\sqrt{5}$ cm^3

323. (b) In this case the breadth becomes the circumference of the base of the cylinder

$\Rightarrow 2\pi r = 44$

$$\Rightarrow r = \frac{44 \times 7}{22 \times 2} = 7 \text{ cm}$$

New volume= $\pi r^2 h$

$$= \frac{22}{7} \times 7 \times 7 \times 100$$

= 15400 cm^3

324. (c) $\pi r^2 H = \frac{1}{3}\pi r^2 h$

$$\Rightarrow H = \frac{1}{3} h$$

$\Rightarrow h = 3H = 3 \times 6 = 18$ cm

325. (c) $3\pi r^2 = 1848$

$$r^2 = \frac{1848 \times 7}{3 \times 22} = 196$$

$\Rightarrow r = 14$ cm

According to the question

$$\frac{2}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$$

$\Rightarrow 2r = h$

$\Rightarrow h = 2 \times 14 = 28$ cm

326. (b) Volume of tunnel = $\pi \times r^2 \times H$

$$= \frac{22}{7} \times \frac{4}{2} \times \frac{4}{2} \times 56 = 704 \text{ m}^3$$

Volume of ditch

= 48 × 16.5 ×4 = 3168 m^3

Required part

$$= \frac{704}{3168} = \frac{2}{9}$$

327. (a) According to the question

$\pi h(R^2 - r^2) = 748$

$$R^2 - r^2 = \frac{748 \times 7}{22 \times 14}$$

$9^2 - r^2 = 17$

$\Rightarrow 9^2 - r^2 = 17$

$\Rightarrow r^2 = 81 - 17 = 64$

$\Rightarrow r = 8$

⇒ Thickness = 9 – 8 = 1 cm

328. (b) $2 \times \left(\frac{4}{3} \times \pi \times r^3\right) = \pi R^2 h$

$$\Rightarrow 2 \times \frac{4}{3} \times \pi \times 27 = \pi \times 36 \times h$$

$$h = \frac{27 \times 4 \times 2}{36 \times 3}$$

$$\Rightarrow h = \frac{8 \times 27}{3 \times 36} = 2 \text{ cm}$$

329. (d) Ratio of height

$= \sqrt[3]{\text{Ratio of volume}}$

$$\Rightarrow \frac{h}{H} = \frac{1}{3}$$

3 units → 30

2 units → 20

⇒ The cut is made 20 cm above the base

330. (d) Radius = 3 Decimetres

= 30 cm

Height of circular sheet

= 1 mm = 0.1 cm

$$\Rightarrow \frac{4}{3}\pi \times (30)^3 = \pi r^2 \times \frac{1}{10}$$

$\Rightarrow r^2 = \sqrt{10000 \times 9 \times 4}$

⇒ r = 600 cm = 6 metres

331. (b) Let no. of seconds required to fill the tank = x

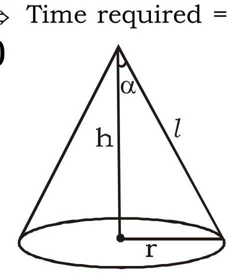
$\Rightarrow (\pi r^2 h) \times x = 3 \times 5 \times 1.54$

$$\Rightarrow x = \frac{3 \times 5 \times 1.54 \times 7 \times 100 \times 100}{22 \times 7 \times 7 \times 5}$$

= 300 seconds

⇒ Time required = 5 minutes

332. (c)



$$\frac{r}{h} = \tan\alpha$$

$\Rightarrow r = h \tan\alpha$

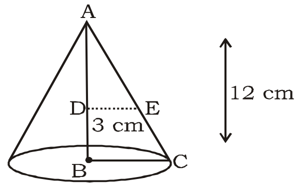
and $\frac{l}{h} = \sec\alpha$

$\Rightarrow l = h \sec\alpha$

$\Rightarrow S = \pi \times h \tan\alpha \times h \sec\alpha$

$= \pi h^2(\tan\alpha \times \sec\alpha)$

333. (c)



As DE | | BC, $\triangle$ ADE ~ $\triangle$ ABC

$\Rightarrow \frac{AD}{AB} = \frac{DE}{BC}$

$\Rightarrow \frac{12-3}{12} = \frac{DE}{6} \Rightarrow \frac{9 \times 6}{12} = DE$

$\Rightarrow$ DE = 4.5 cm

334. (d) Height of cylinder = Diameter of sphere

$\Rightarrow \frac{S_1}{S_2} = \frac{4\pi r^2}{2\pi r \times h} = \frac{2r^2}{2r^2} = \frac{1}{1}$

$\Rightarrow S_1 = S_2$ (h = 2r)

335. (d) $\frac{\pi r^2 h}{\frac{4}{3} r^3 \pi} = 1$

$\frac{h}{r} = \frac{4}{3}$

$\frac{h}{\frac{d}{2}} = \frac{4}{3}$

$\frac{2h}{d} = \frac{4}{3}$, 3h= 2d

336. (a) Volume of water pumped out in one hour

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 12 \times 3600$

= 1663200 cm³ = 1663.2 ltr.

337. (d) $2\pi rh = 1056$

$r = \frac{1056 \times 7}{2 \times 22 \times 16} = \frac{21}{2}$

Volume = $\pi r^2 h = \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times 16$

= 5544 cm³

338. (b) Let the radius and height be 5*x* and 12*x*

$\Rightarrow \frac{1}{3} \times \pi \times 25x^2 \times 12x = \frac{2200}{7}$

$\Rightarrow x^3 = \frac{2200 \times 7 \times 3}{7 \times 22 \times 25 \times 12}$

$\Rightarrow x = 1$

$\Rightarrow$ slant height

$= \sqrt{5^2 + 12^2}$ = 13 cm

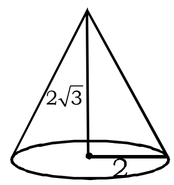
339. (b) $\pi \times r^2 \times H = \frac{4}{3}\pi r^3$

$\frac{1}{10} \times \frac{1}{10} \times 36 \times 100 = \frac{4}{3} \times r^3$

$r^3 = 27$

r = 3 cm

340. (b)



Slant height

$= \sqrt{\left(2\sqrt{3}\right)^2 + 2^2} = \sqrt{12+4} = 4$ cm

341. (b) Volume of vessel

= Volume of roof

$\pi \times r^2 \times h = 22 \times 20 \times x$

(where x is rainfall in cm)

$\Rightarrow \frac{22}{7} \times \frac{100 \times 100 \times 350}{22 \times 20 \times 100 \times 100} = x$

$\Rightarrow$ x = 2.5 cm

342. (a) Volume of remaining solid

$= \frac{2}{3}\pi r^2 h$

$\frac{2}{3} \times \frac{22}{7} \times 36 \times 10 = 240\pi$ cm³

343. (c) Let the height be H

$\Rightarrow \frac{1}{3}\pi r_1^2 H + \frac{1}{3}\pi r_2^2 H = \frac{4}{3}\pi R^3$

$\Rightarrow \frac{1}{3}\pi H (r_1^2 + r_2^2) = \frac{4}{3}\pi R^3$

$\Rightarrow H = \frac{4R^3}{r_1^2 + r_2^2}$

344. (c) Let height and diameter be 3x and 2x

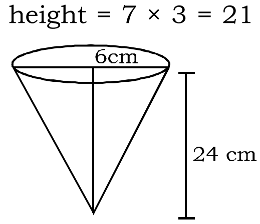
$\Rightarrow \frac{1}{3}\pi x^2 \times 3x = 1078$

$\Rightarrow x^3 = \frac{1078 \times 7}{22} = 49 \times 7$

$\Rightarrow x = 7$

$\Rightarrow$ height = 7 × 3 = 21 cm

345. (a)



Radius of cone = 6 cm

Height of cone = 24 cm

$\therefore$ Volume of cone = $\frac{1}{3}\pi(6)^2 \times 24$ cm³

Cone is converted to sphere

Let radius of sphere = r

$\therefore$ Volume of sphere $\Rightarrow \frac{4}{3}\pi r^3$

Volume of sphere = volume of cone

$\therefore \frac{4}{3}\pi r^3 = \frac{1}{3} \times \pi \times 6 \times 6 \times 24$

$\Rightarrow r^3 = \frac{1}{3} \times \frac{6 \times 6 \times 24}{4} \times 3$

$\Rightarrow r^3 = 6 \times 6 \times 6$

r = 6 cm

$\therefore$ radius of sphere = 6 cm

346. (a) Total surface area of cylinder

$\Rightarrow$ 462 (given)

$\Rightarrow (2\pi rh + 2\pi r^2) = 462$ cm²

r = radius, h = height

$2\pi rh = 462/3$

$\pi r^2 = 154$ cm²

$2\pi r^2 = 154 \times 2 = 308$

$\pi r^2 = 154$

$r^2 = \frac{154}{22} \times 7 = 49$

r = 7 cm

347. (a) Diameter of cylinder = 7 cm

Radius $= \frac{7}{2}$ cm,

height = 16 cm

$\therefore$ Lateral or curved surface area

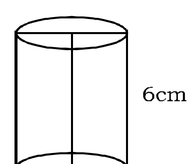
$\Rightarrow 2\pi rh$

$\Rightarrow$ r = radius

h = height

$\therefore 2 \times \frac{22}{7} \times \frac{7}{2} \times 16 \Rightarrow 352$ cm²

348. (a)



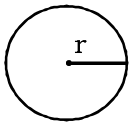
Height of cylinder h= 6 metres

Let radius of cylinder = r metre

$\therefore$ curved surface area = $2\pi rh$

Area of end face = πr^2

$\Rightarrow$ Total area of two end faces

$\Rightarrow$ 

$\Rightarrow$ $2\pi r^2$

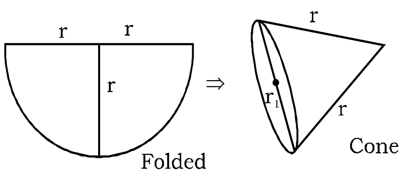
Given that $3 \times 2\pi r^2 = 2 \times 2\pi rh$

$3r = 2h$

$r = 4$ cm

$\therefore$ Radius of base = 4 cm

349. (b)



Radius of semi-circular sheet

$= r \Rightarrow \frac{28}{2}$

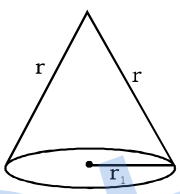
$r = 14$ cm

Circumference of sheet

$= \pi r = 14\pi$ cm

Sheet is folded to form a cone

Let radius of cone = r_1



$\therefore$ The circumference of base of cone

$\Rightarrow$ Circumference of sheet

$\therefore$ $2\pi r_1 = 14\pi$

$r_1 = 7$ cm

$\therefore$ Radius of cone = 7 cm

Slant height

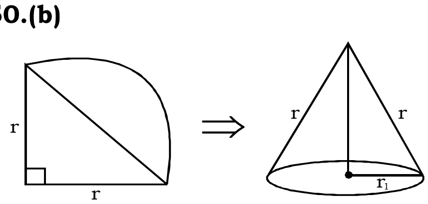
= radius of semi-circular sheet

$r = 14$ cm

$\therefore$ Height = $\sqrt{(14)^2 - (7)^2}$

$= \sqrt{147}$ = 12 cm **(approx)**

350.(b)



$\Rightarrow$ Circumference of sectors = $\frac{\pi r}{2}$

$\Rightarrow$ Circumference of base of cone of radius

$= 2\pi r_1$

$\frac{\pi r}{2} = 2\pi r_1$

$r_1 = \frac{r}{4}$

$\therefore$ Radius of cone = $\frac{r}{4}$

Curved surface area of cone

$= \pi r_1 l$

l = slant height

$l = r$

$\therefore$ Surface area of cone

$\pi \times \frac{r}{4} \times r \Rightarrow \frac{\pi r^2}{4}$

351.(d) radius of cone

$r = 16$ metre (given)

Let slant height = l metre

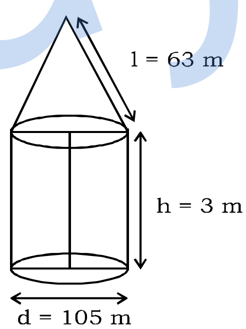
Curved surface area = πrl

$= 427\frac{3}{7} m^2$ (given)

$= \frac{22}{7} \times 16 \times l = \frac{2992}{7}$

$l = \frac{2992}{22 \times 16} = 8.5$ metre

352. (a)



$\therefore$ radius of cone = $\frac{105}{2}$ m

slant height of cone = 63 m

$\Rightarrow$ Curved surface area of cone

$= (\pi rl)$

$= \frac{22}{7} \times \frac{105}{2} \times 63 = 10395$ m²

= Radius of cylinder = $\frac{105}{2}$ m

Height = 3 m (given)

$\therefore$ Curved surface area of cylinder $= 2\pi rh$

$= 2 \times \frac{22}{7} \times \frac{105}{2} \times 3 = 990$ m²

$\therefore$ Total curved area of structure

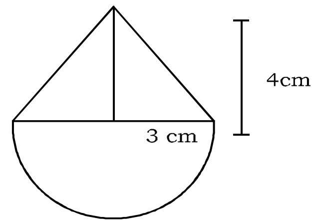
$\Rightarrow$ curved area of cone + curved area of cylinder = 10395 + 990

= 11385 m²

$\therefore$ Total area of canvas

= 11385 m²

353. (b)



Surface area of hemishpere

$= 2\pi r^2$

$= 2 \times \frac{22}{7} \times 9 = 56.57$ cm²

height of cone = 4 cm

radius = 3 cm

$\therefore$ Slant height = $\sqrt{16 + 9}$ = 5 cm

$\therefore$ Surface area of cone = πrl

$= \frac{22}{7} \times 3 \times 5 \Rightarrow 47.14$ cm²

$\therefore$ Total surface area of the toy

Area of cone + area of hemi-sphere

$\Rightarrow 47.14 + 56.57 \Rightarrow 103.71$ cm²

354. (b) diameter of beaker = 7cm

Radius = $\frac{7}{2}$ cm

Level of water rises = 5.6 cm

Diameter of a marble = 1.4 cm

$\therefore$ Radius = $\frac{1.4}{2}$ = 0.7 cm

Let n marbles are dropped so,

Volume of n marbles

$= n \times \frac{4}{3}\pi \times (0.7)^3$

$\Rightarrow n \times \frac{4}{3}\pi \times (0.7)^3$

$= \pi \times \left(\frac{7}{2}\right)^2 \times 5.6$

$\Rightarrow$ $n \times \frac{4}{3} \times \frac{7}{10} \times \frac{7}{10} \times \frac{7}{10}$

$= \frac{7}{2} \times \frac{7}{2} \times \frac{56}{10}$ $\Rightarrow n = 150$

355. (d) Let radius of iron rod = r

$\therefore$ Height = 8r

$\therefore$ Volume of iron rod

$= \pi \times (r)^2 \times 8r \Rightarrow 8\pi r^3$

$\Rightarrow$ Radius of spherical ball

$= \frac{r}{2}$

Volume of spherical ball

$= \frac{4}{3}\pi \times \left(\frac{r}{2}\right)^3$

Let n balls are casted

$\therefore \; n \times \frac{4}{3}\pi\left(\frac{r^3}{8}\right) = 8\pi r^3$

$\Rightarrow \frac{n}{6} = 8 \Rightarrow n = 48$

356. (c) Let the radius of base of second cylinder = R

$\Rightarrow 2(\pi r^2 h) = \pi R^2 h$

$\Rightarrow 2r^2 = R^2$

$\Rightarrow R = r\sqrt{2}$

357. (a) Let the required increase

= x cm

$\Rightarrow \pi(10+x)^2 \times 4 = \pi \times 10^2 \times (4+x)$

$100 + x^2 + 20x = 25(4 + x)$

$x^2 + 20x + 100 = 100 + 25x$

$x^2 - 5x = 0$

$x - 5 = 0$

$x = 5$

$\therefore$ Required increase = 5 cm

358. (b) Let the old volume

$= \frac{1}{3}\pi r^2 h$

$\Rightarrow$ New volume $= \frac{1}{3}\pi(2r)^2 h$

$= 4\pi r^2 h/3$

$\Rightarrow$ New volume is four times the old volume

359. (b) Let the height of cone be 'h' cm

$\frac{1}{3}\pi r^2 h = \frac{4}{3}\pi r^3$

$a^2 h = 4a^3$

$h = 4a$

360. (c) Radius of base $= \frac{33}{2\pi}$

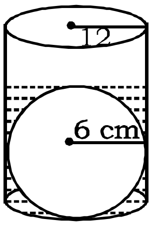
$= \frac{33 \times 7}{2 \times 22} = \frac{21}{4}$ cm

$\therefore$ Volume of cone $= \frac{1}{3} \times \pi \times r^2 \times h$

$= \frac{1}{3} \times \frac{22}{7} \times \frac{21}{4} \times \frac{21}{4} \times 16$

$= 462 \text{ cm}^3$

361. (b)



Let the increase in height

= h cm

$\Rightarrow \pi R^2 h = \frac{4}{3}\pi r^3$

$(12)^2 \times h = \frac{4}{3} \times 6^3$

$h = \frac{4}{3} \times \frac{216}{144} = 2$ cm

362. (d) Height of the cone

= 10.2 – 4.2 = 6 cm

$\Rightarrow$ Volume of the toy

$= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$

$= \frac{1}{3}\pi r^2 (h + 2r)$

$= \frac{1}{3} \times \frac{22}{7} \times (4.2)^2 (2 \times 4.2 + 6)$

$= \frac{1}{3} \times \frac{22}{7} \times (4.2)^2 \times 14.4$

$= 266 \text{cm}^3$ (appx.)

363. (c) Volume of water

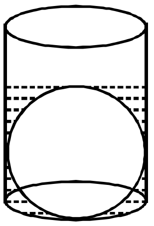
= Volume of cylinder – volume of cone

$= \frac{2}{3}\pi r^2 h = 2\left(\frac{1}{3}\pi r^2 h\right)$

$= 2 \times 27\pi$

$= 54\pi \text{ cm}^3$

364. (c)



Height of water after ball is immersed

= 3.5 × 2 = 7 cm

$\Rightarrow$ Volume of water $= \pi r^2 h - \frac{4}{3}\pi r^3$

$= \pi r^2\left(h - \frac{4}{3}r\right)$

$= \frac{22}{7} \times 3.5 \times 3.5\left(7 - \frac{4}{3} \times 3.5\right)$

$= 11 \times 3.5\left(\frac{7}{3}\right) = \frac{269.5}{3} \text{ cm}^3$

Volume of water before ball was immersed

$= \pi(3.5)^2 \times h = \frac{269.5}{3}$

$= h = \frac{269.5 \times 7}{3 \times 3.5 \times 3.5 \times 22}$

$= \frac{7}{3}$ cm

365. (c) Let height and radius be

= 7x and 5x respectively

$\Rightarrow \pi r^2 h = 550$

$\pi(5x)^2 \times 7x = 550$

$\frac{22}{7} \times 25x^2 \times 7x = 550$

$x^3 = 1$

$x = 1$

$\therefore$ Height = 7 cm

Radius = 5 cm

$\Rightarrow$ Curved surface area = $2\pi rh$

$= 2 \times \frac{22}{7} \times 5 \times 7 = 220 \text{ cm}^2$

366. (a) $\frac{2}{3}\pi r^3 = 19404$

$r^3 = \frac{19404 \times 7 \times 3}{22 \times 2}$

$\Rightarrow r = 21$ cm

$\Rightarrow$ Total surface area $= 3\pi r^2$

$= 3 \times \frac{22}{7} \times 21 \times 21 = 4158 \text{ cm}^2$

367. (a) Slant height of the cone (l)

$= \sqrt{6^2 + 8^2} = 10$ cm

$\Rightarrow$ Required ratio

$= \frac{2\pi rh}{\pi rl} = \frac{2h}{1}$

$= \frac{2 \times 8}{10} = 8 : 5$

368. (a) Let the no. of small balls $= x$

$\Rightarrow \frac{4}{3}\pi \times (10)^3 = x \times \frac{4}{3} \times \pi \times \left(\frac{1}{2}\right)^3$

$\Rightarrow 1000 = x \times \frac{1}{8}$

$\Rightarrow x = 8000$

369. (a) Let the no. of balls = x

$\Rightarrow 44 \times 44 \times 44 = x \times \frac{4}{3} \times \pi \left(\frac{4}{2}\right)^3$

$\Rightarrow \frac{44 \times 44 \times 44 \times 7 \times 3}{22 \times 4 \times 8} = x$

$\Rightarrow$ x = 2541

370. (d) Let the no. of cones = x

$\Rightarrow \pi \times 3^2 \times 5 = x \times \frac{1}{3} \times \pi \times \left(\frac{1}{10}\right)^2 \times 1$

$\Rightarrow$ x = 9×5×3×100 = 13500

371. (c) Slant height of cone

$= \sqrt{8^2 + 6^2} = 10$ cm

Slant height of cone

= radius of sector = 10 cm

372. (d) Volume of sphere

$= \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times (9)^3$

$= 972\pi$ cm³

Volume of cone

$= \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi\ 9^2 \times 9 = 243\pi$ cm³

$\Rightarrow$ % of wasted wood

$= \frac{(972 - 243)\pi}{972\pi} \times 100 = 75\%$

373. (d) Radius of sphere $= \frac{12}{2} = 6$ cm

Let the height of the cylinder = h

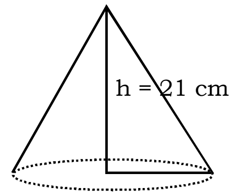
ATQ

Volume and radius are same

$\pi (6)^2 \times h = \frac{4}{3}\pi (6)^3$

$h = \frac{4 \times 6}{3} =$ **8 cm**

374. (b)



Perimeter of base = 8 cm

$2\pi r = 8$

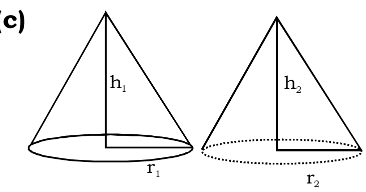
$r = \frac{4}{\pi}$

h = 21 cm

Volume of cone

$= \frac{1}{3} \times \pi \times \frac{4}{\pi} \times \frac{4}{\pi} \times 21 = \mathbf{\frac{112}{\pi}}$ **cm³**

375. (c)



$\frac{V_1}{V_2} = \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2} = \frac{r_1^2 h_1}{r_2^2 h_2} = \frac{4}{1}$

$\left(\frac{r_1}{r_2}\right)^2 \times \left(\frac{h_1}{h_2}\right) = \frac{4}{1}$

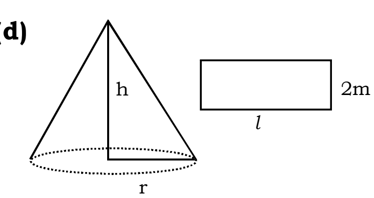
$\therefore \frac{2r_1}{2r_2} = \frac{5}{4} \therefore \frac{r_1}{r_2} = \frac{5}{4}$

$\left(\frac{5}{4}\right)^2 \times \frac{h_1}{h_2} = \frac{4}{1}$

$\frac{25}{16} \times \frac{h_1}{h_2} = \frac{4}{1}$

$\frac{h_1}{h_2} = \mathbf{\frac{64}{25}}$

376. (d)



$\pi r^2 = 154$

$r^2 = \frac{154 \times 7}{22} = 49$

$r = \sqrt{49} = 7$ m

also volume = 1232

$\frac{1}{3}\pi r^2 \times h = 1232$

$h = \frac{1232 \times 3}{\pi r^2} = \frac{1232 \times 3}{154} = 24$

h = 24 m

Area of canvas required $= \pi rl$

$= \pi r\sqrt{r^2 + h^2}$

$= \frac{22}{7} \times 7 \times \sqrt{24^2 + 7^2}$

$= \frac{22}{7} \times 7 \times 25 = 550$ m²

length × 2 = 550 m²

length(l) $= \frac{550}{2} =$ **275 m**

377. (b) Ratio of the volume of cones

$= \frac{\frac{1}{3}\pi r_1^2 h}{\frac{1}{3}\pi r_2^2 h} = \left(\frac{r_1}{r_2}\right)^2 = \left(\frac{3}{4}\right)^2 = \frac{9}{16}$

= **9 : 16**

378. (c) Ratio of surface area of sphere

$\frac{4\pi r_1^2}{4\pi r_2^2} = \frac{4}{9}$

$\left(\frac{r_1}{r_2}\right)^2 = \frac{4}{9}$

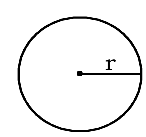
$\frac{r_1}{r_2} = \frac{2}{3}$

Ratio of their volumes

$= \frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3} = \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{2}{3}\right)^3 = \frac{8}{27}$

= **8 : 27**

379. (a)



Total surface area of sphere

$= 8\pi$ square unit

$4\pi r^2 = 8\pi$

$r^2 = 2$

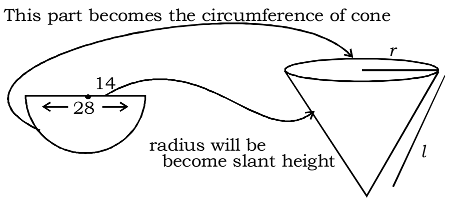
$r = \sqrt{2}$ units

Volume of sphere

$= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times (\sqrt{2})^3 = \frac{8\sqrt{2}\pi}{3}$ units

380. (b)



In this question just cut the semicircular paper and told it to form cone

$\Rightarrow$ Circumference of cone

= circumference of semi circle

$\Rightarrow \frac{2\times\pi\times(14)}{2} = \frac{2\pi r}{2}$

$\Rightarrow 2\pi r = \pi \times 14$

r = 7 cm

Slant height, (l) of cone = radius of semicircular plate

l = 14 cm

$h^2 = l^2 - r^2$

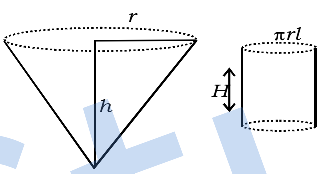
$= 14^2 - 7^2 = 196 - 49$

= 147

$h = \sqrt{147} = 7\sqrt{3}$

Volume of cone = $\frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 7\sqrt{3} = 622.36$ cm³

381. (d)



Volume of water in conical flask

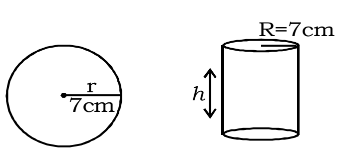
$= \frac{1}{3}\pi r^2 h$

If the height of water level in cylindrical flask = H units

$\therefore \quad \pi m^2 H = \frac{1}{3}\pi r^2 h$

$H = \frac{1}{3} \times \frac{\pi r^2 h}{\pi m^2} = \frac{hr^2}{3m^2}$

382.(d)



Volume of the solid sphere

$= \frac{4}{3}\pi r^3$

$= \frac{4}{3}\pi \times 7 \times 7 \times 7$ cm³

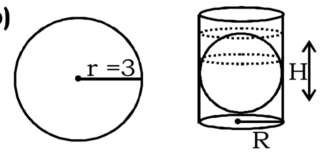
Let the length of wire = h cm

$\pi R^2 h = \frac{4}{3}\pi \times 7 \times 7 \times 7$

$7 \times 7 \times h = \frac{4}{3} \times 7 \times 7 \times 7$

$h = \frac{28}{3}$ cm

383. (b)



Volume of sphere = $\frac{4}{3}\pi r^3$

$= \frac{4}{3}\pi \times 3 \times 3 \times 3 = 36\pi$ cm³

If the water level rises by H cm

$\pi R^2 H = 36\pi$

$6 \times 6 \times h = 36$

h = 1 cm

384. (a) Volume of sphere = volume of rectangular block

$\frac{4}{3}\pi$ (radius)³ = length × breadth × height

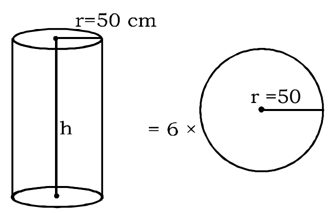
$\frac{4}{3}\pi$ (radius)³ = 21 × 77 × 24

$(\text{radius})^3 = \frac{21\times77\times24\times3\times7}{4\times22}$

$(\text{radius}) = \sqrt[3]{7\times7\times7\times3\times3\times3}$

radius = 7 × 3 = 21 cm

385. (d)



Volume of cylinder

= 6 × volume of a sphere

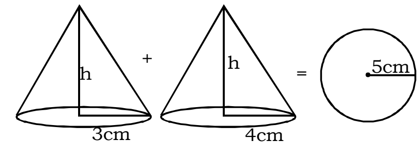
$\pi(50)^2 h = 6\times\frac{4}{3}\pi(50)^3$

$h = 6\times\frac{4}{3}\times50$

= 400 cm

= 4 m

386.(b)



Volume of both the cones will be equal to the volume of sphere

$\frac{1}{3}\pi(3)^2\times h+\frac{1}{3}\pi(4)^2\times h=\frac{1}{3}\pi(5)^3$

$\frac{1}{3}h\{3^2+4^2\} = \frac{4}{3}\times5\times5\times5$

$\frac{1}{3}\times h \times 25 = \frac{4}{3}\times5\times5\times5$

$h = \frac{20}{3}\times3 = 20$ cm

387. (a) Volume of cone = $\frac{1}{3}\pi r^2 h$

Now, $r_1 = 2r$,

$h_1 = 2h$

$\therefore$ Volume of new cone

$= \frac{1}{3}\pi r_1^{\,2} h_1$

$= \frac{1}{3}\pi 2r^2\, 2h = \frac{1}{3}\pi r^2 h \times 8$

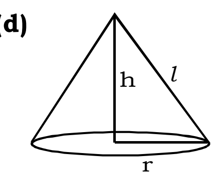
= 8 times of the previous volume

Alternate:-

In the formula of volume of cone, there is power 2 on radius and power 1 on height

$\therefore (2)^2 \times 2 = 8$ times

388. (d)



$C = \pi rl$

$C^2 = \pi^2 r^2 l^2$

$V = \frac{1}{3}\pi r^2 h$

$V^2 = \frac{1}{9}\pi^2 r^4 h^2$

$3\pi vh^3 - c^2h^2 + 9v^2$

$3\pi \times \frac{1}{3}\pi r^2 h \times h^3 - \pi^2 r^2 l^2 h^2$

$+ 9 \times \frac{1}{9}\pi^2 r^4 h^2$

$= \pi^2 r^2 h^4 - \pi^2 r^2 h^2 (r^2 + h^2) + \pi^2 r^4 h^2 = \pi^2 r^2 h^4 - \pi^2 r^4 h^2 - \pi^2 r^2 h^4 + \pi^2 r^4 h^2 =$ **0**

389. (c) volume of rectangular block

$= 11 \times 10 \times 5 = 550\ m^3$

$= 550000\ dm^3$ (1 m = 10 dm)

Volume of a sphere

$= \frac{4}{3}\pi \times \frac{5}{2} \times \frac{5}{2} \times \frac{5}{2}\ dm^3$

$= \frac{1375}{21} \times n = 550000$

n = 8400

390. (a) Required number of spheres

$= \frac{\textit{volume of metallic cone}}{\textit{volume of a sphere}}$

$= \frac{\frac{1}{3}\pi \times 30 \times 30 \times 45}{\frac{4}{3}\pi \times 5 \times 5 \times 5} = 81$

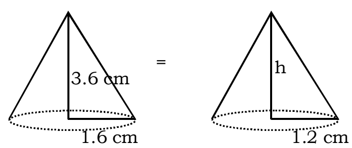
391. (d) Number of cones

$= \frac{\text{volume of sphere}}{\text{volume of cone}}$

$= \frac{\frac{4}{3}\pi(10.5)^3}{\frac{1}{3}\pi(3.5)^2 \times 3}$

$= \frac{4 \times 10.5 \times 10.5 \times 10.5}{3.5 \times 3.5 \times 3}$ = **126**

392.(c)



According to question

$\frac{1}{3} \times \pi \times 1.6 \times 1.6 \times 3.6$

$= \frac{1}{3} \times \pi \times 1.2 \times 1.2 \times h$

$h = \frac{1.6 \times 1.6 \times 3.6}{1.2 \times 1.2} = \frac{16 \times 16 \times 36}{12 \times 12 \times 10}$

$= \frac{64}{10}$ = **6.4 cm**

393.(a) $\frac{S^3}{V^2} = \frac{(4\pi r^2)^3}{\left(\frac{4}{3}\pi r^3\right)^2} = \frac{4^3 \times \pi^3 \times r^6}{4^2 \times \pi^2 \times r^6} \times 3^2$

$= 4 \times \pi \times 9 = \frac{36\pi}{1}$

$= 36\pi$ units

394. (d) Radius of water drop

$= \frac{1}{20}$ cm

volume of a sphere

$= \frac{4}{3}\pi \times \frac{1}{20} \times \frac{1}{20} \times \frac{1}{20}$

Let the radius of cone = R

Height = 2R

According to question

$= \frac{1}{3}\pi \times R \times R \times 2R$

$= \frac{4}{3}\pi \times \frac{1}{20} \times \frac{1}{20} \times \frac{1}{20} \times 32000$

$R^3 = \frac{2 \times 32000}{20 \times 20 \times 20} = \frac{64000}{20 \times 20 \times 20}$

$R^3 = \frac{40 \times 40 \times 40}{20 \times 20 \times 20}$

$R = \frac{40}{20} = 2$

Height of glass

= 2R = 2 × 2 = 4 cm

395. (c) Volume of earth taken out

$= 40 \times 30 \times 12 = 14400\ m^3$

Area of rectangular field

$= 1000 \times 30 = 30000\ m^2$

Area of region of tank

$= 40 \times 30 = 1200\ m^2$

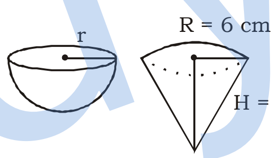
Remaining area

$= 30000 - 1200 = 28800\ m^2$

Increase in height

$= \frac{14400}{28800}$ = **0.5 m**

396. (a)



According to question,

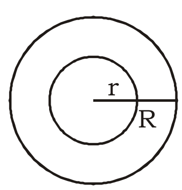
$8 \times \frac{2}{3}\pi r^3 = \frac{1}{3}\pi(6)^2 \times 12$

$r^3 = \frac{6 \times 6 \times 12}{8 \times 2}$

$= 3 \times 3 \times 3$

$r = \sqrt[3]{3 \times 3 \times 3}$ = **3 cm**

397. (d)



Volume of lead $= \frac{4}{3}\pi r^3$

Volume of Gold

$= \frac{4}{3}\pi R^3 - \frac{4}{3}\pi r^3$

According to question,

$\frac{4}{3}\pi R^3 - \frac{4}{3}\pi r^3 = \frac{4}{3}\pi r^3$

$\frac{4}{3}\pi R^3 = \frac{8}{3}\pi r^3$

$R^3 = 2r^3$

$R^3 = 2(2)^3$

$R = \sqrt[3]{2} \times 2 = 1.259 \times 2$

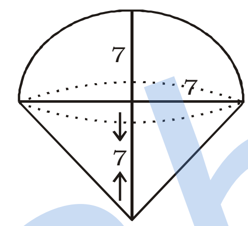
$= 2.518$

∴ Thickness = R – r

= 2.518 – 2

= 0.518 cm

398. (a)



In the question,

Radius of hemisphere

= Radius of cone = height of cone = 7 cm

(∴ height of hemisphere

= radius of hemisphere

Volume of ice cream

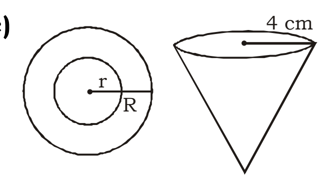
= Volume of hemisphere part + volume of conical part

$= \frac{2}{3} \times \frac{22}{7} \times (7)^3 + \frac{1}{3} \times \frac{22}{7} \times 7^3$

$= \frac{22}{7} \times 7^3 = 22 \times 7^2$

$= 1078\ cm^3$

399. (c)



Volume of material of hollow sphere = Volume of cone

$\frac{4}{3}\pi(5^3 - 3^3) = \frac{1}{3}\pi(4)^2 \times h$

98 = 4 h

$h = \frac{98}{4}$ = **24.5 cm**

400.(d) Radius of the base of conical shape = r cm

$\therefore$ Radius of base of cylinder

$= \frac{r}{3}$ cm

Volume of water = volume of cone

$= \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi r^2 \times 24$

$= 8\pi r^2 \ cm^3$

Volume of cylinder = volume of water

$\pi \left(\frac{r}{3}\right)^2 \times H = 8\pi r^2$

H = 9 × 8 = **72 cm**

401. (b) Volume of metallic sphere = volume of cone

$= \frac{4}{3}\pi \times 3 \times 3 \times 3$

$= \frac{1}{3}\pi R^2 h$

$\frac{4}{3}\pi \times 3 \times 3 \times 3$

$= \frac{1}{3} \times \pi \times 6 \times 6 \times h$

$h = \frac{108}{6 \times 6}$

= **3 cm**

402. (d) Number of bottles

$= \frac{\text{volume of hemispherical bowl}}{\text{volume of cylindrical bottle}}$

$= \frac{\frac{2}{3}\times\pi\times15\times15\times15}{\pi\times\frac{5}{2}\times\frac{5}{2}\times6}$ = **60**

403. (a) volume of cone

$V_1 = \frac{1}{3}\pi r^2 h$

$= \frac{\pi}{3} r^3 \ (\because h = r)$

Volume of sphere

$V_2 = \frac{4}{3}\pi r^3$

Volume of cylinder

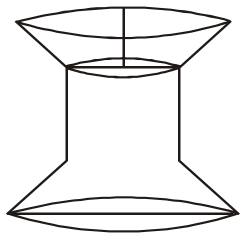
$V_3 = \pi r^2 h = \pi r^3$

$\therefore V_1 : V_2 : V_3$

$= \frac{1}{3} : \frac{4}{3} : 1 = 1 : 4 : 3$

$V_1 = \frac{V_2}{4} = \frac{V_3}{3}$

404. (b)



Height of kaleidoscope = 25 cm

Radius of kaleidoscope = 35 cm

Paper used = curved surface area of cylinder

$= 2 \times \frac{22}{7} \times 35 \times 25$

= 2 × 22 × 5 × 25

= 5500 cm^2

405. (b) Let the height of cone h metre

$\Rightarrow$ Total area of ground will be required

= 5 × 16m^2= 80 m^2

$\Rightarrow$ Total volume of air is needed

= 100 × 5 m^3 = 500 m^3

According to the question

$\Rightarrow$ Volume of cone = 500 m^3

$\Rightarrow \frac{1}{3}$ area of ground × height = 500

$\Rightarrow \frac{1}{3} \times \pi r^2 \times h = 500$

$= \frac{1}{3} \times 80 \times h = 500$

$\Rightarrow$ Height $= \frac{500 \times 3}{80}$

$\Rightarrow$ Height of cone

= 18.75 metres

406. (d) Volume of cone = Lateral Surface Area

$\frac{1}{3}\pi r^2 h = \pi rl \quad [l = \sqrt{h^2 + r^2}]$

$\frac{rh}{3} = \sqrt{h^2 + r^2}$

Squaring both sides

$\frac{1}{9} = \frac{h^2 + r^2}{r^2 h^2}$

$\frac{1}{9} = \frac{h^2}{r^2 h^2} + \frac{r^2}{r^2 h^2}$

$\frac{1}{9} = \frac{1}{r^2} + \frac{1}{h^2}$

407. (c) Diagonal of cube will be equal to diameter of sphere

$\sqrt{3}a = 2 \times r$

$\sqrt{3}a = 2 \times 6\sqrt{3}$

a = 12

Surface area

$= 6a^2 = 6 \times 12 \times 12 \Rightarrow 864 \ cm^2$

408. (c) Let hemisphere radius be = R and Sphere radius be = r

ATQ,

$\frac{2}{3}\pi R^3 = 4 \times \frac{4}{3}\pi r^3$

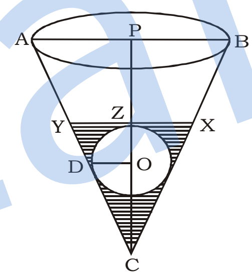
$2R^3 = 16 r^3$

$\frac{R^3}{r^3} = \frac{8}{1}$

$\frac{R}{r} = \frac{2}{1}$

So option 'C' is answer

409. (a)



$\Delta ABC = equilateral \Delta$

$\therefore \angle ACB = 60^0$

$\& \angle BCP = 30^0$

$\Delta CDO, \angle CDO = 90^0$

(Angle b/w radius and tangent is 90

OD = 1P = 1 cm

OC = 2P =2(1) = 2 cm

then, CZ = OC + OZ

=2+1 = 3 cm

$\Delta CZY, \angle CZY = 90^0$

$CZ = \sqrt{3}P = 3cm$

$YZ = 1P = \sqrt{3}cm$

Now, In cone XYC

$r = ZY = \sqrt{3}cm$

h = CZ = 3 cm

Vol.of cone

$= \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(\sqrt{3})^2(3)$

$= 3\pi \ cm^2$

Vol. of sphere

$= \frac{4}{3}\pi r_s^3$ $(\because r_s = 1\text{ cm})$

$= \frac{4}{3}\pi \text{ cm}^3$

Vol. of water that can immerse the ball

$= \left(3\pi - \frac{4\pi}{3}\right)\text{cm}^3 = \frac{5\pi}{3}\text{ cm}^3$

410. (b) Here h = 4c,

Volume of cylinder = $\pi r^2 h$

$= \frac{4\pi \times \pi r^2 h}{4\pi}$

(Multiply 4π both in Numerator & denominator)

$= \frac{(2\pi r)^2 \times (4c)}{4\pi} = \frac{c^3}{\pi}$

411. (a) According to the question,

Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of cyclinder = $\pi r^2 h$

$\frac{4}{3}\pi r^3 = \pi r^2 h$

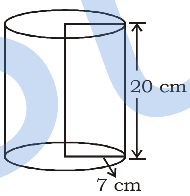
$= \frac{4}{3}r = h = h = \frac{4}{3}\times 3 = 4\text{cm}$

C.S.A of cylinder = $2\pi rh$

$= 2 \times \frac{22}{7}\times 3 \times 4$

$= \frac{44\times 12}{7} = \frac{528}{7} = 75\frac{3}{7}\text{ cm}^2$

412. (d)



According to the question,

$\Rightarrow$ r = 7 cm

$\Rightarrow$ h = 20 cm

$\Rightarrow$ Total surface Area of cylinder

= curved surface Area + 2 × area of base

$= 2\pi rh + 2\pi r^2$

$= 2\pi r\,[r + h]$

$= 2 \times \frac{22}{7}\times 7(7+20)$

= 44 × 27

$\Rightarrow$ TSA of cylinder = 1188 cm^2

413. (d) According to question,

Given:

$\Rightarrow$ Radius of cylinder = r

$\Rightarrow$ CSA of cylinder = $4\pi r h$

$\Rightarrow$ As we know

$\Rightarrow$ Curved surface area of cylinder = 2π R H

$4\pi r h = 2\pi \times r \times$ Height

$\Rightarrow$ Height = 2h unit

414. (a) According to the question,

Radius = 3.5 cm

$\Rightarrow$ In the question it is given that A hemi-spherical bowl is to be painted inside as well as outside

Total area that is to be painted

= Inside area of bowl + outside area of bowl

$= 2\pi r^2 + 2\pi r^2 = 4\pi r^2$

$= 4\times\frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\text{ cm}^2$

$\Rightarrow$ Painting Rate

= 10cm² in 5 Rs.

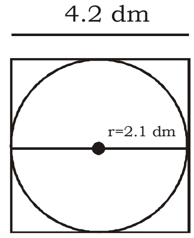
1 cm² will be painted = $\frac{5}{10}$

= Rs. $\frac{1}{2}$

So total cost will be painted in

$= 4\times\frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\times\frac{1}{2}$ = Rs. 77

415. (b)



r = 2.1 dm

h = 4.2 dm

(for Max.)

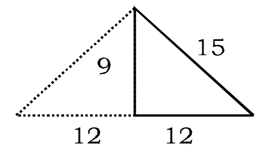
Volume of cone

$= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\times\frac{22}{7}\times 2.1\times 2.1\times 4.2$

= 19.404 dm³

416. (a)



Volume $\Rightarrow \frac{1}{3}\pi r^2 h$

$\Rightarrow \frac{1}{3}\pi\, 12\times 12\times 9$

$\Rightarrow 144\times 3\pi \Rightarrow 432\pi$

417. (c) According to the question,

Volume of cone = $\frac{1}{3}\pi r^2 h$

Height = 7 cm

Radius = $\frac{7}{2}$cm

$\therefore$ Volume of cone

$= \frac{1}{3}\times\frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\times 7 =$ **89.8 cm³**

418. (b) Radius of Ist solid metallic spheres = R = 6cm

Radius of IInd solid metallic spheres = r = 1 cm

Internal Radius of hollow sphere = x

External Radius of hollow sphere = x + 1

So, $\frac{4}{3}\pi(R^3+r^3) = \frac{4}{3}\pi\{(x+1)^3 - x^3\}$

$216 + 1 = x^3 + 1 + 3x(x+1) - x^3$

$216 = 3x(x+1)$

$72 = x^2 + x$

$\Rightarrow x^2 + x - 72 = 0$

After solving,

x = 8 cm

So, The external radius of the hollow sphere

$= x + 1 = 8 + 1 = 9$ cm

419. (a) Let the time taken to fill the tank

= x hrs

$\Rightarrow (\pi r^2 h)\times x = 50\times 44\times\frac{7}{100}$

$\Rightarrow x = \frac{50\times 44\times 7\times 7\times 100\times 100}{22\times 7\times 7\times 100\times 5000}$

= 2 hrs

420. (b) $\Rightarrow$ The area of ground

$\Rightarrow$ 1.5 hectares = 1.5×10000 m^2

$\Rightarrow$ 15000 m^2

1 hectare = 10000 m^2

$\Rightarrow$ level of rainfall

= height of water level

$= 5 \text{ cm} = \frac{5}{100}$ m

$\therefore$ Volume of collected water

$\Rightarrow 15000 \times \frac{5}{100} = 750 \text{ m}^3$

421. (d) Required quantity of water

$= \frac{3 \times 40 \times 2000}{60} = 4{,}000 \text{ m}^3$

422. (b) Let the no. of hours be 'x'

$x\left(\pi R^2 H\right) = \pi r^2 h$

$\Rightarrow 3000 \times \pi \times \frac{10}{100} \times \frac{10}{100} \times x$

$= \pi \times \frac{10}{2} \times \frac{10}{2} \times 2$

$\Rightarrow \frac{6}{10} \times x = 1$

$x = \frac{10}{6}$ = 1 hour 40 minutes

423. (a) Diameter = 5 mm = 0.5 cm

radius = 0.25 cm

volume of water flowing from the pipe in 1 minute

$= \pi \times 0.25 \times 0.25 \times 1000 \text{ cm}^3$

Volume of conical vessel

$= \frac{1}{3} \pi \times 15 \times 15 \times 24 \text{ cm}^3$

$= \frac{1}{3} \pi \times 15 \times 15 \times 24 \text{ cm}^3$

$\therefore$ Time

$= \frac{\frac{1}{3} \times \pi \times 15 \times 15 \times 24}{\pi \times 0.25 \times 0.25 \times 1000}$

$= 28\frac{4}{5}$

= 28 minutes 48 seconds

424. (d) r = 12 m, h = 9 m

$l = \sqrt{r^2 + h^2} = \sqrt{12^2 + 9^2} = 15$ m

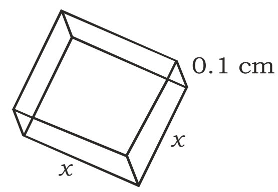
Cost of canvas

= curved surface area × cost of 1 m^2

$= \pi r l \times 120$

= 3.14 × 12× 15 ×120 = **₹ 67824**

425. (d)



8.4 gm = 1 cm^3

$4725 \text{ gm} = \frac{4725}{8.4} \text{cm}^3$

volume = $x \times x \times 0.1$

$\frac{4725}{8.4} \text{cm}^3 = x^2 \times 0.1$

***x* = 75 cm**

426. (d) According to the question.

Diameter = 84cm

Radius = 42 cm = 0.42 m

Height = 120 cm = 1.2 m

$\therefore$ Circumference of cylinder

$= 2\pi rh$

$= \frac{2 \times 22 \times 0.42 \times 1.2 \times 1.5 \times 500}{7}$

= ₹ 2376

427. (a) We are given that volume of two cubes are in the ratio

= 27 : 1

$\left(\frac{3}{1}\right)^3 = \frac{27}{1}$

$\frac{a_1}{a_2} = \sqrt[3]{\frac{27}{1}}$

$= \frac{3}{1} =$ **3 : 1**

428. (a) Ratio of edges of cuboid

= 1:2:3

Let, $l = x$, $b = 2x$, $h = 3x$

Surface area = 88 cm^2

$2(lb + bh + hl) = 88$

$2(2x^2 + 6x^2 + 3x^2) = 88$

$11x^2 = 44$

$x^2 = 4$

$x = 2$

$\therefore$ l = 2 cm, b = 4 cm,

h = 6cm

$\therefore$ Volume $= l\, b\, h$

= 2 × 4 × 6

= 48 cm^3

429. (b) $\frac{R_1}{R_2} = \frac{2}{3}, \frac{H_1}{H_2} = \frac{5}{3}$

Ratio of volumes

$= \frac{V_1}{V_2} = \frac{\pi R_1^2 H_1}{\pi R_2^2 H_2}$

$= \left(\frac{R_1}{R_2}\right)^2 \times \left(\frac{H_1}{H_2}\right)$

$= \left(\frac{2}{3}\right)^2 \times \left(\frac{5}{3}\right)$

$= \frac{4}{9} \times \frac{5}{3} = \frac{20}{27}$

430. (d) $2\pi r h = 264$ .... (i)

$\pi r^2 h = 924$ ....(ii)

On dividing: $\frac{2\pi r h}{\pi r^2 h} = \frac{264}{924}$

$\frac{2}{r} = \frac{264}{924}$

$r = \frac{924 \times 2}{264}$

= 7 cm

Diameter = 2r = 2 × 7 = 14cm

Putting, r = 7 in (i)

$2\pi r h = 264$

$h = \frac{264 \times 7}{2 \times 22 \times 7} = 6$ cm

Required ratio $= \frac{2r}{h}$

$= \frac{14}{6} = \frac{7}{3}$

431. (b) $\frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2} = \frac{2}{3}$

$\frac{1 \times h_1}{2^2 \times h_2} = \frac{2}{3}$

$\frac{h_1}{h_2} = \frac{8}{3}$

432. (c) $\frac{(a_1)^3}{(a_2)^3} = \frac{27}{64}$

$\frac{a_1}{a_2} = \frac{3}{4}$

Ratio of their total surface area

$= \frac{6a_1^2}{6a_2^2} = \left(\frac{a_1}{a_2}\right)^2$

$= \left(\frac{3}{4}\right)^2 = \frac{9}{16}$

= **9 : 16**

433. (b) Radius of both Hemisphere and cone = R
Also height of hemisphere is equal to its Radius = R
∴ height of both hemisphere and cone = R
Now, In cone
slant height,

$$l = \sqrt{R^2 + R^2} = \sqrt{2}R$$

$$\frac{\text{C.S.A of hemisphere}}{\text{C.S.A of cone}}$$

$$= \frac{2\pi R^2}{\pi R \times \sqrt{2}R} = \frac{\sqrt{2}}{1} = \sqrt{2} : 1$$

434. (c) Let height of cone = h
Radius of cone = r
Volume of cone

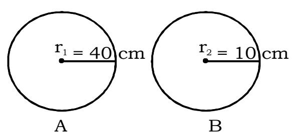
$$= \frac{1}{3}\pi r^2 h$$

Now height is doubled,
Volume of new cone

$$= \frac{1}{3}\pi r^2 (2h) = \frac{1}{3}\pi r^2 h$$

Required ratio
= 1 : 2

435. (d)

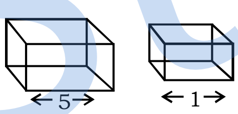


$$\frac{\text{surface area of A}}{\text{Surface area of B}} = \frac{4\pi r_1^2}{4\pi r_2^2}$$

$$= \left(\frac{r_1}{r_2}\right)^2 = \left(\frac{40}{10}\right)^2 = \frac{16}{1}$$

⇒ 16 : 1

436. (d)



Ratio of total surface area

$$= \frac{6(1)^2}{6(5)^2} = \frac{1}{25} \Rightarrow 1 : 25$$

437. (b) Let $r_1 = \frac{21}{2}$ cm

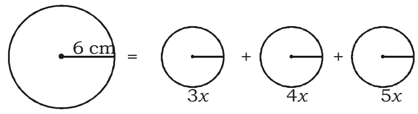
$$r_2 = \frac{17.5}{2} \text{ cm}$$

∴ Required ratio

$$= \frac{4\pi r_1^2}{4\pi r_2^2} = \frac{r_1^2}{r_2^2}$$

$$= \frac{21 \times 21}{17.5 \times 17.5} = \frac{36}{25} = 36 : 25$$

438. (a)



$$\frac{4}{3}\pi\{(3x)^3 + (4x)^3 + (5x)^3\}$$

$$= \frac{4}{3}\pi(6)^3$$

$$x^3 (27 + 64 + 125) = 216$$

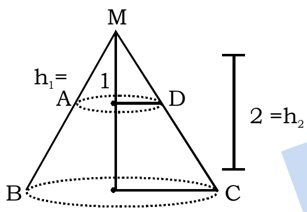
$$x^3 \times 216 = 216$$

$$x^3 = \frac{216}{216} = 1$$

$$x = \sqrt[3]{1} = 1$$

Radius of smallest sphere
$= 3x$
$= 3 \times 1 = 3$ cm

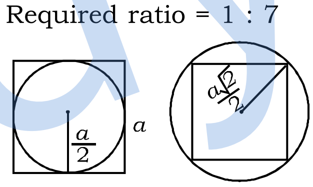
439. (d)



$$\frac{\text{Volume of smaller cone}}{\text{Volume of larger cone}} = \frac{h_1^3}{h_2^3} = \frac{1^3}{2^3} = \frac{1}{8}$$

area of part(ABCD)
(i.e frustum) = 8 – 1 = 7
∴ Required ratio = 1 : 7

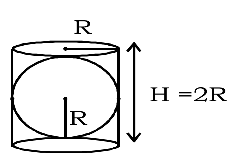
440. (a)



$$\frac{\text{area of incircle}}{\text{area of circum circle}} = \frac{\pi\left(\frac{a}{2}\right)^2}{\pi\left(\frac{a\sqrt{2}}{2}\right)^2}$$

$$= \frac{1}{2} \Rightarrow 1 : 2$$

441. (b)



(height of cylinder = 2 ×R)

$$\frac{\text{Surface area of sphere}}{\text{C.S.A of cylinder}} = \frac{4\pi R^2}{2\pi R \times H}$$

$$= \frac{4\pi R^2}{2\pi R(2R)}$$

$$= \frac{4\pi R^2}{4\pi R^2} = \frac{1}{1} = 1 : 1$$

442. (a) $\frac{4}{3}\pi r^3 = \pi r^2 h$

$$\Rightarrow h = \frac{4}{3} r$$

$$\Rightarrow r = \frac{3}{4} h$$

$$\Rightarrow \text{diameter} = \frac{3}{4} \times 2h = \frac{3}{2} h$$

$$\Rightarrow \frac{\text{Diameter}}{\text{Height}} = \frac{3}{2}$$

443. (a) In this case height of cylinder and cone is equal to the radius of hemisphere
⇒ h = r
Ratio of volumes

	Cone		hemisphere		cylinder
=	$\frac{1}{3}\pi r^2 \times r$	:	$\frac{2}{3}\pi r^3$	:	$\pi r^2 \times r$
=	1	:	2	:	3

444. (a) $\frac{\pi R^2 H}{\pi r^2 h} = \frac{3}{1}$

$$\Rightarrow \frac{3 \times 3 \times H}{2 \times 2 \times h} = \frac{3}{1}$$

$$\Rightarrow \frac{H}{h} = \frac{4}{3}$$

$$\Rightarrow \frac{x}{1} = \frac{4}{3}$$

$$\Rightarrow x = \frac{4}{3}$$

445. (c) $\frac{4}{3}\pi R^3 = 64 \times \frac{4}{3}\pi r^3$

$$\frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3} = 64$$

$$\left(\frac{8}{r}\right)^3 = (4)^3$$

⇒ r = 2 cm
Ratio of area
= (Ratio of radius)²
= (8 : 2)² = 16 : 1

446. (a) $\frac{\pi R_1^2 H}{\pi R_2^2 h} = 1$

$$\frac{3^2 \times H}{2^2 \times h} = 1$$

$$\Rightarrow \frac{H}{h} = \frac{4}{9}$$

447.(a) $\frac{V_1}{V_2} = \frac{r^2 h}{R^2 H} = \frac{3^2 \times 4}{4^2 \times 3} = \frac{3}{4}$

448. (d) Ratio of volume of bigger cone and smaller cone

= (Ratio of altitude)^3

= $(1 : 2 : 3)^3 = (1 : 8 : 27)$

$\therefore$ Ratio of parts

= 1 : 8–1 : 27–8

= 1:7:19

449. (a) Let radii of cylinder and sphere be r

Total surface area of cylinder

= $2\pi rh + 2\pi r^2$

Total surface area of sphere

= $4\pi r^2$

$\therefore$ given that $2 \times 4\pi r^2 = 2\pi r(h + r)$

$\therefore$ 4r = r + h

$\therefore$ h = 3r

$\therefore$ Ratio of volume of cylinder and sphere

$= \pi r^2 \times 3r : \frac{4}{3}\pi r^3 = 9 : 4$

450.(c) $\frac{4}{3}\pi R^3 = \pi r^2 H$

$\frac{4}{3}R^3 = r^2 H$

$\frac{R^2}{r^2} = \frac{3}{4}$ $\quad (\because H = R)$

$R : r = \sqrt{3} : \sqrt{4} = \sqrt{3} : 2$

451. (b) $\frac{a^3}{\frac{4}{3}\pi r^3} = \frac{363}{49}$

$\frac{a^3}{r^3} = \frac{363 \times 22 \times 4}{49 \times 7 \times 3}$

$\frac{a^3}{r^3} = \left(\frac{22}{7}\right)^3$

$\frac{a}{r} = \frac{22}{7}$

452. (a) cone $\Rightarrow$ radius : height

4 : 3

Let 4x : 3x

$\therefore$ curved surface area of cone

$\Rightarrow \pi rl$

r = radius

l = slant height

$l = \sqrt{h^2 + r^2}$

$= \sqrt{(4x)^2 + (3x)^2} = 5x$

$\therefore$ Curved surface area

$\Rightarrow \pi \times 4x \times 5x$

$\Rightarrow 20\pi x^2$

$\therefore$ Total surface area

$\Rightarrow \pi r l + \pi r^2$

$\Rightarrow \pi r(l + r)$

$\Rightarrow \pi \times 4x(5x + 4x)$

$\Rightarrow \pi \times 4x \times 9x$

$\Rightarrow 36\pi x^2$

$\therefore$ Curved area : Total area

$20\pi x^2$: $36\pi x^2$

5 : 9

453. (b) Let radius of sphere

= radius of cylinder = r

$\therefore$ let height of cylinder = h

$\therefore$ given that volume of sphere = volume of cylinder

$= \frac{4}{3}\pi r^3 = \pi r^2 h$

$\Rightarrow \frac{4}{3}r = h$

$\therefore$ Curved surface area

Cylinder : sphere

$2 \times \pi \times r \times \frac{4r}{3}$: $4\pi r^2$

$\Rightarrow \frac{8}{3}$: 4

$\Rightarrow$ 2 : 3

454. (c) Radius of cone = radius of cylinder = r

Height of cone = height of cylinder = h

$\frac{\text{curved surface area of cylinder}}{\text{curved surface area of cone}}$

$= \frac{2\pi rh}{\pi rl} = \frac{2\pi rh}{\pi rl} = \frac{8}{5}$

$\Rightarrow \frac{h}{l} = \frac{4}{5}$

$\Rightarrow l^2 = \sqrt{(h)^2 + (r)^2}$

$\Rightarrow h^2 = 16,\ l^2 = 25$

r = 3

$\therefore$ Radius : Height

3 : 4

455. (b) Ratio of volume

$= \frac{\pi(\sqrt{3})^2 \times \sqrt{2}}{\frac{1}{3}\pi(\sqrt{2})^2 \times \sqrt{3}} = \frac{3\sqrt{3}}{\sqrt{2}}$

$= 3\sqrt{3} : \sqrt{2}$

456. (a) Ratio of radius of earth and moon

= 4 : 1

$\Rightarrow$ Ratio of volume = $4^3 : 1^3 = 64 : 1$

457. (b) Let the radius of cylinder and sphere be = r cm

$\Rightarrow$ Height of cylinder = 2r cm

$\Rightarrow A = \pi r^2 \times 2r = 2\pi r^3$

$B = \frac{4}{3}\pi r^3$

$\Rightarrow \frac{A}{B} = \frac{2\pi r^3}{\frac{4}{3}\pi r^3} = 3 : 2$

458. (d) Let the radius of hemisphere and sphere be 'r' and 'R'

$\Rightarrow \frac{4}{3}\pi R^3 = \frac{2}{3}\pi r^3$

$\frac{R^3}{r^3} = \frac{1}{2}$

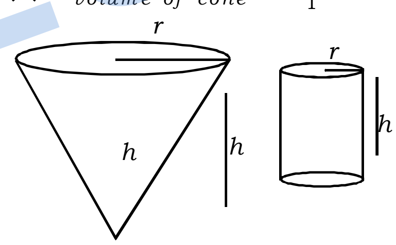
$\frac{R}{r} = \frac{1}{\sqrt[3]{2}}$

$\Rightarrow$ Ratio of curved surface area

$= \frac{4\pi R^2}{2\pi r^2} = \frac{2R^2}{r^2} = \frac{2 \times 1}{\left(\sqrt[3]{2}\right)^2}$

$= \frac{2}{(2)^{2/3}} \Rightarrow \frac{R}{r} = \frac{2^{1/3}}{1}$

459. (b) $\frac{\text{Volume of cylinder}}{\text{volume of cone}} = \frac{3}{1}$

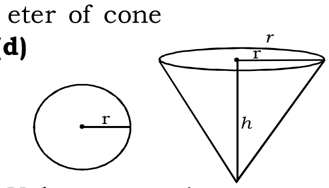


$\frac{\pi r_1^2 h}{\frac{1}{3}\pi r_2^2 h} = \frac{3}{1}$

$\Rightarrow r_1 = r_2$

$\therefore$ Diameter of cylinder = Diameter of cone

460.(d)



Volume remains same:

Volume of sphere

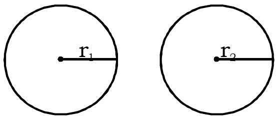
= volume of cone

$\frac{4}{3}\pi r^3 = \frac{1}{3} \times \pi \times r^2 \times h$

4r = h

$\frac{h}{r} = \frac{4}{1}$ = **4 : 1**

461. (a)



Ratio of volume of sphere × ratio of weight per 1 cc. of material of each

= Ratio of weight of two sphere

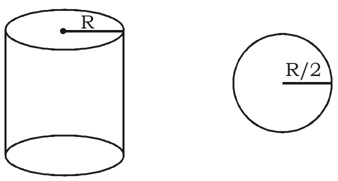
$$\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3}\times\frac{289}{64}=\frac{8}{17}$$

$$\frac{r_1^3}{r_2^3}=\frac{8\times64}{17\times289}=\frac{8\times8\times8}{17\times17\times17}$$

$$\frac{r_1}{r_2}=\frac{8}{17}$$

$\Rightarrow$ **8 : 17**

462. (d)



Let the Radius of cylinder = R

$\Rightarrow$ Therefore, Radius of sphere

$= \frac{R}{2}$

Volume of Right circular cylinder

$= \pi R^2 H$

Volume of sphere

$$= \frac{4}{3}\pi\left(\frac{R}{2}\right)^3 = \frac{4}{3}\pi\frac{R^3}{8} = \frac{\pi R^3}{6}$$

According to question,

Volume of cylinder = Volume of sphere

$$\pi R^2 H = \frac{\pi R^3}{6}$$

$$\frac{\pi R^2 H\times6}{\pi R^3} = 1$$

$$\frac{H}{R} = \frac{1}{6} \Rightarrow 1 : 6$$

463. (d) Radius of longer sphere

= R units

Its volume = $\frac{4}{3}\pi R^3$

Now cones are formed with base radius and height same as the radius of larger sphere

$\therefore$ Volume of smaller cone

$= \frac{1}{3}\pi R^3$

and one of the cone is converted into smaller sphere

Therefore volume of smaller sphere

$= \frac{1}{3}\pi R^3$

$$\therefore \frac{4}{3}\pi r^3 = \frac{1}{3}\pi R^3$$

$$\frac{r^3}{R^3} = \frac{1}{4}$$

$$\frac{r}{R} = \frac{1}{\sqrt[3]{4}}$$

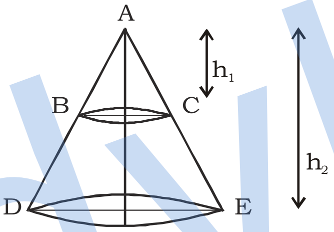
$$\therefore \frac{\text{Surface area of smaller sphere}}{\text{Surface area of larger sphere}}$$

$$= \frac{4\pi r^2}{4\pi R^2} = \frac{r^2}{R^2}$$

$$\Rightarrow \frac{(1)^2}{\left((4)^{\frac{1}{3}}\right)^2} = \frac{(1)^2}{\left((2)^{\frac{2}{3}}\right)^2} = \frac{1}{2^{\frac{4}{3}}}$$

$$\Rightarrow 1 : 2^{\frac{4}{3}}$$

464. (c)



$$\frac{\text{Volume of Cone ABC}}{\text{Volume of BCED}} = \frac{1}{1}$$

$$\frac{\text{Volume of Cone ABC}}{\text{Volume of Cone ADE}} = \frac{1}{1+1}$$

$$= \frac{1}{2}$$

If a cone is cut in any parts parallel to its base then the ratio of volume of smaller cone to the volume of larger cone is equal to the ratio of the cubes of their corresponding heights/ radii/slant height (it is proved by similarity)

$$= \left(\frac{\text{height of Cone }(h_1)}{\text{height of Cone}(h_2)}\right)^3 = \frac{1}{2}$$

$$\frac{h_1}{h_2} = \frac{1}{\sqrt[3]{2}}$$

$\Rightarrow h_1 : h_2 - h_1$

$= 1 : \sqrt[3]{2} - 1$

$1 : \left(\sqrt[3]{2} - 1\right)$

465. (d) Let side of square be = x

Area of square = x^2

Side of new formed square

= x + 50% of x = $1.5x$

Area of new formed square

= $(1.5x)^2 = 2.25x^2$

Ratio of the area

(new square) : area of

(original square)

= $2.25x^2 : x^2 = 9 : 4$

Quicker approach

Let side of square = 100%

(100% + 50%)²	:	(100%)²
9	:	4

466. (a) Volume of cone = $\frac{1}{3}\pi r^2 h$

$$= \frac{1}{3}\times\frac{22}{7}\times1^2\times7 = \frac{22}{3}\text{ cm}^3$$

Volume of cubical block

$=10\times5\times2\text{ cm}^3 = 100\text{ cm}^3$

Wastage of wood

$$= \left(100 - \frac{22}{3}\right)\text{ cm}^3$$

$$= \left(\frac{300-22}{3}\right) = \frac{278}{3}\text{ cm}^3$$

$$\%\text{ wastage} = \frac{\frac{278}{3}}{100}\times100$$

$$= \frac{278}{3}$$

$$= \mathbf{92\frac{2}{3}\%}$$

467. (c) Decrease in radius

$= 50\% = \frac{1}{2}$

Increase in height = 50%

$= \frac{1}{2}$ → Increment, 2 → Original

	Radius	Height	Volume
Original	2	2	$(2)^2\times(2) = 8$
	↓ 50% decrease	↓ 50% increase	↓ −5
New	1	3	$(1)^2\times(3) = 3$

Reduction in volume

$$= \frac{5}{8}\times100$$

$$= \mathbf{62\frac{1}{2}}\%$$

468. (a) Increase in radius

$= 100\% = \frac{1}{1}$

Increase in height

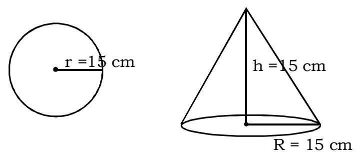
$= 100\%$

$= \frac{1}{1}$

	Radius	Height	Volume
Original	1	1	$(1)^2 \times (1) = 1$
	↓	↓	↓ 7
New	2	2	$(2)^2 \times (2) = 8$

% Increase $= \frac{7}{1} \times 100 =$ **700%**

469. (d)



Volume of cone

$= \frac{1}{3} \times \pi (15)^2 \times 15 = \frac{1}{3} \pi (15)^3$

Volume of sphere $= \frac{4}{3} \pi (15)^3$

Required percentage

$= \frac{\text{volume of cone}}{\text{volume of sphere}} \times 100$

$= \frac{\frac{1}{3} \times \pi \times (15)^3}{\frac{4}{3} \times \pi (15)^3} \times 100$

$= \frac{1}{4} \times 100 = 25\%$

470. (d)

Height	1	→ 3
Radius	2	→ 1
volume	4	→ 3

% Decrease $= \frac{4-3}{4} \times 100 = 25\%$

471. (d) height = 100%

Radius = 100%

$\frac{1}{1}$ → Increment → Original $\frac{1}{1}$ → Increment → Original

	height	Radius	volume
Original	1	1	$(1)^2 1 = 1$
New	2	2	$(2)^2 (2) = 8$

= Eight times that of original

472. (b) use $x + y + \frac{xy}{100}$

Percentage change in area

$= 15 - 10 + \frac{15 \times (-10)}{100}$

$= 5 - 1.5 = 3.5\%$

(3.5 % increase)

REMEMBER

When change in area is asked in the question, then use this formula to save your valuable time.

473. (b)

Radius	2	→ 1
Height	5	→ 8
Volume	20	→ 8

⇒ Volume decreases

% Decrease (% कमी)

$= \frac{20-8}{20} \times 100 = 60\%$

474. (d)

Length	1	→ 2
Breadth	2	→ 6
Height	3	→ 9
volume	6	→ 108

⇒ New volume = 18 times the original volume

⇒ Increase in volume

= 18 – 1 = 17 times

475. (c)

Radius	10	→ 11
Height	10	→ 11
Volume	1000	→ 1331

⇒ % Increase $= \frac{1331 - 1000}{1000} \times 100$

= 33.1%

476. (a) % Change in height

= % change in volume = 100%

477. (a) Volume of coffee

$= \frac{2}{3} \pi r^3 = \frac{2}{3} \times \frac{22}{7} \times (4)^3$

$= \frac{128}{3} \pi \text{ cm}^3$

Volume of cone $= \frac{1}{3} \pi r^2 \times h$

$= \frac{1}{3} \pi (8)^2 \times 16$

$= \frac{1024}{3} \pi$

∴ Required percentage

$= \frac{\frac{1024}{3} - \frac{128}{3}}{\frac{1024}{3}} \times 100$

$= \frac{896}{1024} \times 100 = 87.5\%$

478. (a) Decrease in base radius = (Decrease in base area)$^{1/2}$

$= \left(\frac{1}{9}\right)^{\frac{1}{2}} = \frac{1}{3}$

Let initial radius and height be = $3r$ and h

∴ New radius and height are r and 6 h

old lateral surface area

$= 2 \times \pi \times 3r \times h$

$= 6 \pi rh$

New lateral surface area

$= 2 \times \pi \times r \times 6h = 12 \pi rh$

Required factor $= \frac{12\pi rh}{6\pi rh} = 2$

479. (c) Let the original radius be 'r'

⇒ Area $= 4 \pi r^2$

New area $= 4 \pi (2r^2) = 16 \pi r^2$

⇒ New area is 4 times the old area

480. (a) Volume of tetrahedron

$= \frac{a^3}{6\sqrt{2}} = \frac{12^3}{6\sqrt{2}} = \frac{1728}{6\sqrt{2}}$

$= 144\sqrt{2} \text{ cm}^3$

481.(a) Volume of bucket

$= \frac{1}{3} \pi h(R^2 + r^2 + Rr)$

$= \frac{1}{3} \times \frac{22}{7} \times 45 (28^2 + 7^2 + 28 \times 7)$

$= \frac{22}{7} \times 15 \times 1029 = 48510 \text{ cm}^3$

482. (c) Side of regular hexagon

= 2a cm

Area of hexagon

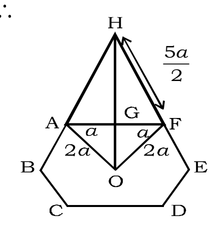
$= 6 \times \frac{\sqrt{3}}{4} \times (2a)^2$

⇒ $6\sqrt{3}a^2 \text{ cm}^2$

Slant edge of pyramid

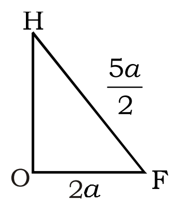
⇒ $\frac{5a}{2}$ cm

∴



Slant edge ⇒ $\frac{5a}{2}$

(Given)



$\Rightarrow$ HF = $\frac{5a}{2}$ (slant height)

$\Rightarrow$ OH = Height (h)

$\Rightarrow$ (2a) (given)

height $\Rightarrow \sqrt{\left(\frac{5a^2}{2}\right) - (2a)^2}$

$= \sqrt{\frac{25a^2}{4} - 4a^2} = \frac{3a}{2}$

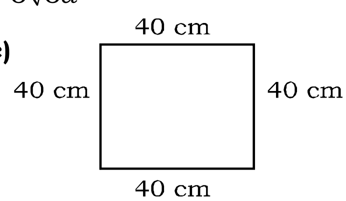
$\therefore$ Volume of pyramid

$= \frac{1}{3}$ area of base × height

$= \frac{1}{3} \times 6\sqrt{3}a^2 \times \frac{3}{2}a$

$= 3\sqrt{3}a^3$ cm³

483. (c)



$\Rightarrow$ Area of base = 40 × 40

= 1600 cm²

Let height of pyramid = h

$\therefore$ Volume = $\frac{1}{3}$ × h × area of base

$= \frac{1}{3}$ × h × 1600

$\Rightarrow$ 8000 (given) = h = 15 cm

484. (c) Area of trapezium

$= \frac{1}{2}$ × h (AB + CD)

$= \frac{1}{2}$ ×8 × (8 + 14)

= 4 × 22 = 88 cm²

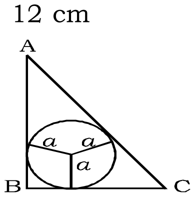
= Volume of prism = Height of prism × area of base

$\Rightarrow$ height × 88 = 1056 (given)

$\Rightarrow$ height × 88 = $\frac{1056}{88}$

$\Rightarrow$ 12 cm

485. (d)



r - inradius of incircle of triangle

Perimeter = 15 cm (given)

$\therefore$ Semiperimeter (S) = $\frac{15}{2}$ cm

Inradius of any triangle

r $\Rightarrow \frac{\Delta}{s}$

r = $\frac{\text{area}}{\text{semiperimeter}}$

Where Δ is the area of triangle

$\therefore$ r = 3 cm given

$3 \Rightarrow \frac{\text{area of triangle}}{\frac{15}{2}}$

$3 \times \frac{15}{2}$ = area of triangle

$\Rightarrow \frac{45}{2}$ cm = area of triangle

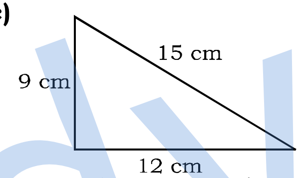
$\therefore$ Volume of prism

$\Rightarrow$ 270 cm³ (given)

$\therefore$ 270 = h × $\frac{45}{2}$

$\Rightarrow$ h = 12 cm

486.(c)



9, 12, 15 is a triplet which forms a right angle triangle

$\therefore$ area of base of prism

$\Rightarrow \frac{1}{2} \times 9 \times 12 = 54$ cm²

Perimeter of triangle

= 9 + 12 + 15 = 36 cm

$\therefore$ total surface area of prism

= perimeter base × height + 2 area of base

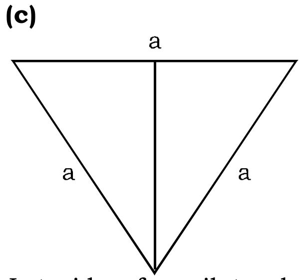
$\Rightarrow$ height of prism = 5 cm (given)

$\therefore$ total surface area

= 36 × 5 + 2 × 54

$\Rightarrow$ 180 + 108 = 288 cm²

487. (c)



Let side of equilateral triangle be = a

$\therefore$ Area = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4}a^2 = 173$ cm²

$\Rightarrow$ a² = $\frac{173}{\sqrt{3}} \times 4$

($\sqrt{3} = 1.73$)

$\therefore$ a² = $\frac{173}{1.73} \times 4$

$= \frac{173}{173} \times 4 \times 100$

a² = 400

a = 20 cm.

Perimeter of base = 20 × 3 = 60 cm

$\therefore$ Volume of prism = 10380 cm³ (given)

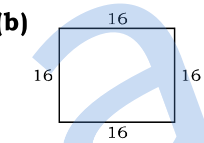
Area of base × height

height = $\frac{10380}{173}$ = 60

LSA = Perimeter of base × height

LSA = 60 × 60 = 3600 cm²

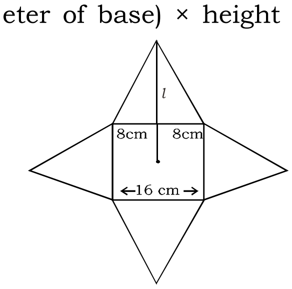
488.(b)

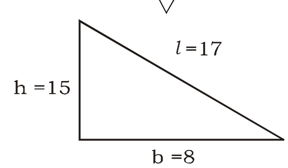


Perimeter of the base

= 4 × 16 = 64 cm

Curved or lateral surface area of pyramid = $\frac{1}{2}$ × (perimeter of base) × height





$\Rightarrow$ Height of pyramid = 15 cm

$\Rightarrow$ Base = 8 cm

$\Rightarrow$ Slant height of pyramid

$l = \sqrt{(15)^2 + (8)^2} \Rightarrow 17$ cm

$\Rightarrow$ Curved surface area of pyramid

$\Rightarrow \frac{1}{2} \times 64 \times 17 \Rightarrow 544$ cm²

489. (c) Volume of pyramid

$= \frac{1}{3} \times$ Area of base $\times$ height

$= \frac{1}{3} \times 57 \times 10 = 190 \text{ cm}^3$

490. (c) Let the side of square base = a cm

$\Rightarrow 2a^2 + 4a \times h = 608$

$\Rightarrow 2a^2 + 4a \times 15 = 608$

$\Rightarrow a^2 + 30a = 304$

$\Rightarrow a^2 + 38a - 8a - 304 = 0$

$\Rightarrow a(a + 38) - 8(a + 38) = 0$

$\Rightarrow a = -38, 8$

$\Rightarrow a = 8$ cm

$\therefore$ Volume of prism $= 8 \times 8 \times 15 = 960 \text{ cm}^3$

491. (b) Volume of prism $= \frac{\sqrt{3}}{4} a^2 \times h$

$= \frac{\sqrt{3}}{4} \times (8)^2 \times 10$

$= 160\sqrt{3} \text{ cm}^3$

492. (b) Volume of prism

$= \frac{1}{2} \times 10 \times 12 \times 20 = 1200 \text{ cm}^3$

$\Rightarrow$ Weight of prism $= 1200 \times 6 = 7200$ gm $= 7.2$ kg

493. (a) Total slant surface area

$= 4 \times \frac{1}{2} \times 4 \times a = 12$

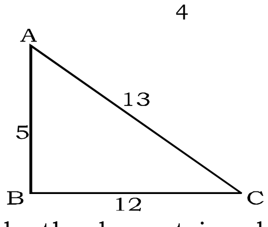
(where a is the side of the square base)

$\Rightarrow a = \frac{12}{8} = \frac{3}{2}$ cm

$\Rightarrow$ area of base $= \frac{9}{4} \text{ cm}^2$

$\therefore$ Required ratio $= \frac{12}{\frac{9}{4}} = 16 : 3$

494. (a)



Clearly the base triangle is the right triangle

$\therefore$ Area of triangle ABC

$= \frac{1}{2} \times 5 \times 12 = 30 \text{ cm}^2$

Volume of the pyramid

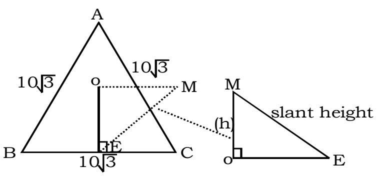
$= \frac{1}{3} \times (\textit{base area}) \times$ height

$\frac{1}{3} \times$ Base area $\times$ height $= 330$

$\frac{1}{3} \times 30 \times$ height $= 330$

height $= \frac{330 \times 3}{30} =$ **33 cm**

495. (d)



Base is equilateral triangle

In radius of equilateral triangle

$= OE = \frac{\textit{side of equilateral } \Delta}{2\sqrt{3}}$

$= \frac{10\sqrt{3}}{2\sqrt{3}} = 5$ cm

Slant length, $l = \sqrt{h^2 + OE^2}$

$= \sqrt{h^2 + 25}$

Total surface area $= 270\sqrt{3}$

$\frac{1}{2}$(Perimeter of base $\times$ slant height + Base area)

$= 270\sqrt{3}$

$\frac{1}{2}\left\{30\sqrt{3} \times \sqrt{(h^2 + 25)}\right\} + \frac{\sqrt{3}}{4}$

$(10\sqrt{3})^2 = 270\sqrt{3}$

$15\sqrt{3}\sqrt{h^2 + 25} + 75\sqrt{3}$

$= 270\sqrt{3}$

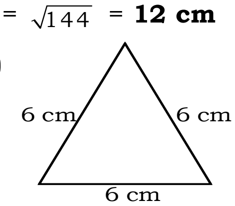
$\sqrt{h^2 + 25} = 13$

$h^2 + 25 = 169$

$h^2 + 169 - 25 = 144$

$h = \sqrt{144} =$ **12 cm**

496. (a)



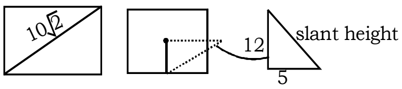
Volume of prism = area of base $\times$ height

$= \frac{\sqrt{3}}{4}(6)^2 \times$ height

$\frac{\sqrt{3}}{4} \times 6 \times 6 \times$ height $= 81\sqrt{3}$

Height $= \frac{81\sqrt{3} \times 4}{\sqrt{3} \times 6 \times 6} =$ **9 cm**

497. (d)



Side of square $= \frac{1}{\sqrt{2}} \times 10\sqrt{2} = 10$ cm

Slant height $= \sqrt{5^2 + 12^2} = 13$ cm

Lateral surface area $= \frac{1}{2} \times$ perimeter of base $\times$ Slant height

$= \frac{1}{2} \times 40 \times 13 = 260 \text{ cm}^2$

498. (d) Total surface area of prism = (perimeter of base $\times$ height + 2 $\times$ base area)

$= (3 \times 12 \times 10) + 2 \times \frac{\sqrt{3}}{4} \times 12^2$

$= 360 + 72\sqrt{3} = 72(5 + \sqrt{3}) \text{ cm}^2$

499. (d) Height of pyramid = 6 m

Diagonal of square base $= 24\sqrt{2}$ m

Side of square = 24 m

Area of square $= (24)^2 = 576 \text{ m}^2$

Volume of the pyramid

$= \frac{1}{3} \times$ area of base $\times$ height

$= \frac{1}{3} \times 576 \times 6 = 576 \times 2 =$ **1152 m³**

500. (a) Volume of pyramid

$= \frac{1}{3} \times$ area of base $\times$ height

$500 = \frac{1}{3} \times 30 \times$ height

height $= \frac{500 \times 3}{30} = 50$ m

501. (a) Lateral surface area of prism = 120

base perimeter $\times$ height = 120

3 $\times$ (side) $\times$ height = 120

(Perimeter of eq. Δ = 3$\times$ side)

Side $\times$ height $= \frac{120}{3} = 40$ ... (i)

Volume of prism $= 40\sqrt{3}$

Area of base $\times$ height $= 40\sqrt{3}$

$\frac{\sqrt{3}}{4}(\text{side})^2 \times \text{height} = 40\sqrt{3}$

$(\text{side})^2 \times$ height $= \frac{40\sqrt{3} \times 4}{\sqrt{3}}$

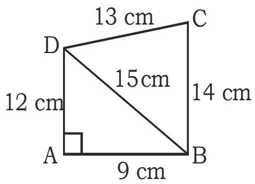
$= 160$ ...(ii)

Dividing (ii) by (i)

$\frac{(\text{side})^2 \times \text{height}}{\text{side} \times \text{height}} = \frac{160}{40}$

side = 4 cm

502. (a)



In Δ ABD,

BD = $\sqrt{AB^2 + AD^2}$ = $\sqrt{9^2 + 12^2}$

= $\sqrt{81+144}$ = $\sqrt{225}$ = 15 cm

Area of Δ ABD

= $\frac{1}{2}$ × AB × AD

= $\frac{1}{2} \times 9 \times 12$ = 54 cm²

In Δ BCD

Semiperimeter

= $\frac{13+14+15}{2}$ = $\frac{42}{2}$ = 21

Area of ΔBCD

= $\sqrt{s(s-a)(s-b)(s-c)}$

= $\sqrt{21(21-13)(21-14)(21-15)}$

= $\sqrt{21 \times 8 \times 7 \times 6}$ = 21 × 4 = 84 cm²

Area ABCD = 84 + 54 = 138 cm²

Height of prism

= $\frac{\text{volume}}{\text{Area of base}} = \frac{2070}{138}$ = 15 cm

Perimeter of base

= 9 + 14 + 13 + 12 = 48 cm

Area of lateral surface

= perimeter × height = 48 × 15

= **720 cm²**

503. (a) As we know, Volume of Right Prism = Area of the base × Height

⇒ $7200 = \frac{3\sqrt{3}}{2} P^2 \times 100\sqrt{3}$

⇒ 72×2 = 9P²

⇒ P² = 16

⇒ P = 4

504. (b) Half of its lateral edges

⇒ Half of its edges

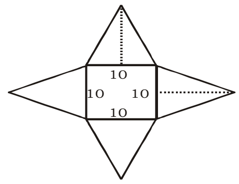
⇒ Half of its volume

Then, volume reduced by = 50%

505. (b) Total surface area

$= 4 \times \left[\frac{\sqrt{3}}{4} \times 1^2\right] = \sqrt{3}\ \text{cm}^2$

506. (a)



Area of base

= 10 × 10 = 100 cm²

Area of 4 Phase

= ($\frac{1}{2}$ × Base × slant height) × 4

⇒ ($\frac{1}{2}$ × 10 × 13) × 4

= 65 × 4 = 260

[Slant height =

$\sqrt{12^2 + 5^2} = \sqrt{169}$ = 13]

Total Surface area

⇒ 260 + 100

⇒ 360 cm²

507. (d) Volume of prism = (area of base × height

Area of base (i.e area of triangle)

⇒ Area of base

= $\sqrt{s(s-a)(s-b)(s-c)}$

= (By Heron's formula)

So, S = $\frac{13+20+21}{2} = \frac{54}{2} = 27$

⇒ $\sqrt{27(27-13)(27-20)(27-21)}$

⇒ $\sqrt{27 \times 14 \times 7 \times 6}$

⇒ $\sqrt{9 \times 3 \times 2 \times 7 \times 7 \times 2 \times 3}$

⇒ $\sqrt{9 \times 9 \times 7 \times 7 \times 2 \times 2}$

⇒ 9 × 7 × 2

Volume of Prism

= $(9 \times 7 \times 2) \times 9 = 1134 cm^3$

508. (d) Let the side of the square

= a cm

ATQ T.S.A = C.S.A + 2 base area

C.S.A= base perimeter × h

Volume = base area × h

∴ T.SA = base perimeter × h + 2 base area

192 = 4a × 10 +2a²

2a² + 40a – 192 = 0

a² + 20a – 96 = 0

a² + 24a– 4a – 96 = 0

a (a+ 24)–4 (a+24) = 0

(a+24) (a–4) = 0

∴ a = 4, (–24)

∴ a = 4

(Side can never be – ve)

Volume = base area × h

Volume = 16×10

Volume = 160 cm³

509. (c) According to the question,

V = number of vertices of prism = 6

e = edges of prism = 9

f= faces of the prism = 5

ATQ,

$\frac{v+e-f}{2} = \frac{6+9-5}{2} = \frac{10}{2} = 5$

510. (c) ATQ

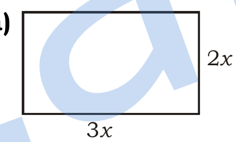
Volume of prism = Area of base × height

= trapezium area × height

= $\frac{1}{2}$(10 + 6) × 5 × 8

= 16 × 5 × 4 = 320 cm³

511. (a)



Base of prism

⇒ Length : Breadth

$3x$: $2x$

Perimeter of base

= 2($3x$ + $2x$) = $10x$

Area of base

⇒ $2x \times 3x = 6x^2$

Height of Prism

= 12 cm (given)

Total surface area of prism

= Perimeter of base × height + 2 × area of base

288 = 10 x × 12 +12 x^2

12 x^2 +120x – 288 = 0

x^2 + 10x – 24 = 0

$\boldsymbol{x = 2}$

∴ Area of base

⇒ 6 × 4 ⇒ 24 cm²

∴ Volume of prism

⇒ 24 × 12 ⇒ 288 cm³

512. (b) Volume of the part (prism)
= Area of base × height
Area of base (Isosceles Δ)
$= \frac{b}{4}\sqrt{4a^2 - b^2}$
$= \frac{6}{4}\sqrt{4(5)^2 - (6)^2}$ = 12 cm²
Volume of prism = 12 × 8 = 96 cm³

513.(c) According to the question
Volume of cylinder = $\Pi r^2 h$
Volume of Sphere = $\frac{4}{3}\Pi r^3$
The number of spherical balls
$= \frac{\Pi r^2 h}{\frac{4}{3}\Pi r^3}$
$= \frac{30 \times 30 \times 40 \times 3}{4 \times 1 \times 1 \times 1} = 27000$

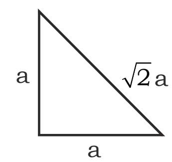
514. **(d)** According to the question
Volume of cylinder = Volume of cone
$\pi r^2 h_1 = \frac{1}{3}\pi r^2 h_2$
$\frac{h_1}{h_2} = = \frac{1}{3}$

515. **(d)** According to the question
C.S.A of cylinder
$= 2\pi rh = 2\pi r_1^2$
C.S.A of sphere = $4\pi r_2^2$
$2\pi r_1^2 = 4\pi r_2^2$
$\frac{r_1}{r_2} = \frac{\sqrt{2}}{1}$
$\frac{\text{Volume of cylinder}}{\text{Volume of sphere}} = \frac{\pi r_1^2 h}{\frac{4}{3}\pi r_2^3}$
$= \frac{2\sqrt{2} \times 3}{4} = \frac{3}{\sqrt{2}}$

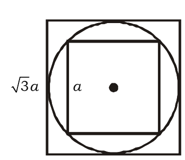
516. **(c)** Let the radius of wire=1 cm
Volume of cone = $\frac{1}{3}\pi r^2 h$
$= \frac{1}{3}\pi (1)^2 h = \frac{1}{3}\pi h$
New radius of wire = $\frac{1}{3}$ cm
Volume of new cone
$= \frac{1}{3}\pi\left(\frac{1}{3}\right)^2 H$
$\frac{1}{27}\pi H$
Volume of old cone = Volume of new cone
$\frac{1}{3}\pi h = \frac{1}{27}\pi H$
H = 9h
Height of new cone is increased by 9 times.

517. (c) Painted Area of Prism
= 151.20 × 5 = 756.00 cm²
AC = 15
[By using pythagoras theorem]
Total surface Area = Perimeter of base × Height + 2 × Area of base
$= (15 + 9 + 12) \times h + 2 \times \frac{1}{2} \times 9 \times 12$
756 = 36 × h + 108
36h = 756 – 108
$h = \frac{648}{36}$ = 18 cm

518. (a) By option (a)
Area Increment = 20 + 20 + $\frac{20 \times 20}{100}$ = 44%

519. (d)


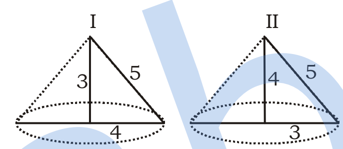
Then perimeter of triangle
a+a+$\sqrt{2}$a = $\sqrt{2}$+1
2a+$\sqrt{2}$a = $\sqrt{2}$+1
$\sqrt{2}$a ($\sqrt{2}$+1)= $\sqrt{2}$+1
then a = $\frac{1}{\sqrt{2}}$
Then length of hypotenuse
= $\sqrt{2}$a = $\sqrt{2} \times \frac{1}{\sqrt{2}}$ = 1 cm

520. (a)


Volume of small cube = a³
length of big cube = $\sqrt{3}a$
Then diameter of sphere = $\sqrt{3}a$
diameter of sphere is equal to side of big cube
Volume of big cube
$= (\sqrt{3}a)^3 = 3\sqrt{3}a^3$
$V_1 : V_2 = a^3 : 3\sqrt{3}a^3 = 1 : 3\sqrt{3}$

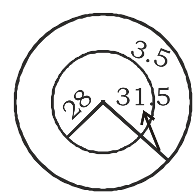
521. (b)
$\frac{4}{3} \times \frac{22}{7}\left(r_1^3 + r_2^3 + r_3^3\right) = \frac{4}{3} \times \frac{22}{7} \times R^3$
$\Rightarrow \frac{4}{3} \times \frac{22}{7}(1 + 8 + 27) = \frac{4}{3} \times \frac{22}{7} \times R^3$
$\Rightarrow$ R³ = 36cm³
R = 3.3 cm
= 3.2 cm (Approximate)

522. (a) Vol. of sphere = Vol. of Cylinder = Vol. of cone
$\Rightarrow \frac{4}{3} \times \pi r^3 = \pi r^2 h_1 = \frac{1}{3}\pi r^2 h_2$
$\Rightarrow \frac{4}{3} \times r = h_1 = \frac{1}{3}h_2$
$\Rightarrow 4r = 3h_1 = h_2$
$\Rightarrow$ r : h_1 : h_2
3 : 4 : 12

523. (a)


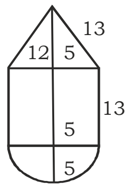
$\frac{\text{Vol. of Ist cone}}{\text{Vol. of IInd cone}} = \frac{\frac{1}{3} \times \pi \times (4)^2 \times 3}{\frac{1}{3} \times \pi \times (3)^2 \times 4} = \frac{4}{3}$

524. (b) $\frac{4}{3}\pi r^3 = \pi r^2 h$
$\frac{4}{3}$ ×6 = h
h = 8 cm.
Curved surface area of cylinder
= 2πrh = 2 × π × 6 × 8
= 96π cm²

525. (a)


width = 3.5 cm
r = $\frac{56}{2}$ = 28 cm
R = 28+3.5 = 31.5 cm
Area of path = πR² – πr²
= π(R²–r²) = π(R+r) (R–r)
= π(59.5)×3.5
$= \frac{22}{7}$ ×(59.5)×3.5 = 654.5
Total cost = 654.5 × 4 = 2618 Rs.

526. (d)



$\pi rl + 2\pi rh + 2\pi r^2 = 770$

$\pi r(l + 2h + 2r) = 770$

$\frac{22}{7} \times 5\,(l + 13 \times 2 + 10) = 770$

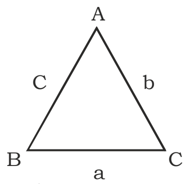
$l + 26 + 10 = 49$

$l = 13$

Height of cone = 12 (pythgoras)

Total height=12+5+13=30cm.

527.(b)



a = 2b

$\frac{a}{b} = \frac{2}{1}$

a = $2x$, b = x and c = $x + 11$

$2x + x + x + 11 = 67$

$4x = 67 - 11$

$x = 14$

Smallest side = 14 cm

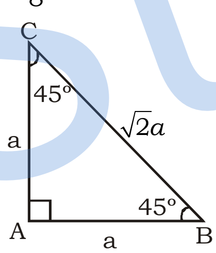
528.(d) $2\pi r = 7$

$r = \frac{7 \times 7}{2 \times 22} = \frac{49}{44}$

$\pi r^2 h = \frac{22}{7} \times \frac{49}{44} \times \frac{49}{44} \times 11$

$= \frac{343}{8} = 42.875\ cm^3$

529.(b)



Perimeter = $a + a + \sqrt{2}a$

$= 10 + 10\sqrt{2}$

$(2a + \sqrt{2}a) = (10 + 10\sqrt{2})$

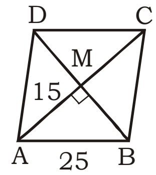
$\sqrt{2}a\,(1 + \sqrt{2}) = 10\,(1 + \sqrt{2})$

$a = \frac{10}{\sqrt{2}}$

BC (hypotenuse) = $\sqrt{2}\,a$

$= \frac{\sqrt{2} \times 10}{\sqrt{2}} = 10$ cm

530. (a)

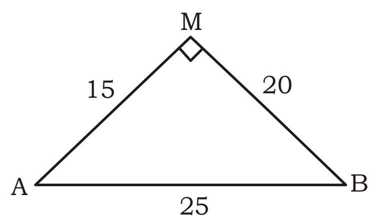


ABCD is a Rhombus

(Diagonal of Rhombus bisects each other at Right angle)

$MB = \sqrt{(AB)^2 - (MA)^2}$

$= \sqrt{(25)^2 - (15)^2} = 20$ cm



Area of Δ MAB $= \frac{1}{2} \times 15 \times 20 = 150$

∵ Rhombus has 4 equal Triangles

Area of Rhombus ABCD

$= 4 \times 150 = 600\ cm^2$

531. (b) volume of cube = vol. of wire. $[a^3 = \pi r^2 h]$

Diameter of wire = 1 m.m

$= \frac{1}{10}$ cm

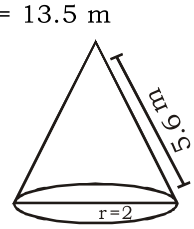
$r = \frac{1}{10 \times 2} = \frac{1}{20}$

2.2×2.2×2.2

$= \frac{22}{7} \times \frac{1}{20} \times \frac{1}{20} \times h$

h = 13.5 m

532. (a)



Diamerter of cone = 4 m

Radius = 2 m

Slant height = 5.6 m

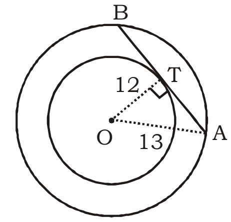
Area of Canvass = Curve surface area of Cone = πrl

$= \pi rl = \frac{22}{7} \times 2 \times 5.6 = 35.2\ m^2$

Cost of canvass = 35.2 × 3.2

= ₹ 112.64

533. (c)



Line BTA is the tangent of small circle

OT will make $\perp^r$ on line AB

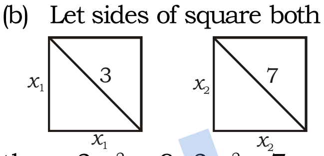
Then In right angle ΔOTA

$AT^2 = \sqrt{(13)^2 - (12)^2} = \sqrt{25}$

AT = 5

AB = 10

534. (b) Let sides of square both x_1, x_2



then $2x_1^2 = 9$ $2x_2^2 = 7$

$x_1 = \frac{3}{\sqrt{2}}$ $x_2 = \frac{7}{\sqrt{2}}$

Then $= A_1 : A_2 = x_1^2 : x_2^2$

$= \frac{9}{2} : \frac{49}{2}$

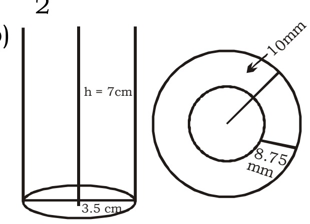
$A_1 : A_2 = 9 : 49$

535. (c) n = 10

No. of Diagonals = $\frac{n(n-3)}{2}$

$= \frac{10 \times 7}{2} = 35$

536. (b)



1 cm = 10 mm

Volume = $\pi r^2 h = \pi \times \frac{7}{2} \times \frac{7}{2} \times 7$

Radius of Bearing = 1cm

Thickness of Bearing

= 8.75mm = 0.875 cm

Internal radius of Bearing

= 1 – 0.875 = 0.125

Volume of Bearing

$= \frac{4}{3} \times \pi\,((1)^3 - (0.125)^3)$

Total number of Bearing

$= \frac{\pi \times 3.5 \times 3.5 \times 7}{\frac{4}{3} \times \pi \times .99804}$

= 64 (approx.)

537. (b) Volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times (3.5)^2 \times 7 = 269.5$

Remaining Volume = 269.5 – 9.75
= 259.75

Volume of one bearing

$= \frac{4}{3} \times \frac{22}{7} \times (1)^3 = 4.19$

Number of bearings

$= \frac{259.75}{4.19} = 61.99 = 62$ (approx)

538. (c) Volume of soil = $\pi r^2 h$
$= \pi \times 5.6 \times 5.6 \times h$

Height of Platform = 1.97 m

Volume of Embankment

$\pi (R^2 - r^2) \times \text{height} = \pi \times 5.6 \times 5.6 \times h$

$\Rightarrow \pi (R - r)(R + r) \times 1.97 = \pi \times 5.6 \times 5.6 \times h$

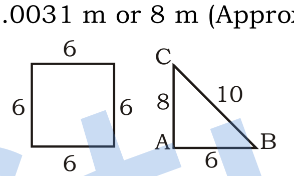
$\Rightarrow 7 \times (18.2) \times 1.97 = 5.6 \times 5.6 \times h$

$\Rightarrow 250.98 = 31.36 \times h$

height $= \frac{250.98}{31.36}$

= 8.0031 m or 8 m (Approx)

539. (a)

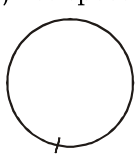


Side of square

$= \frac{24}{4} = 6$

Then area of $\triangle ABC = \frac{1}{2} \times 8 \times 6 = 24\ cm^2$

540. (a) Let speed of both is V and U



the by relative speed

V – U = 3.5 – 1.5

= 2.0 m/s

Then time $= \frac{600}{2} = 300$ sec

$= \frac{300}{60} = 5$ min

541. (d) 1 cm = 10 mm

6 cm = 60 mm

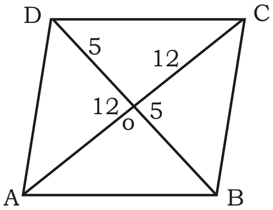
Let n No. of small balls can be made then

$n \times \frac{4}{3}\pi r^3 = \frac{4}{3}\pi R^3$

$n = \frac{R^3}{r^3} = \frac{60 \times 60 \times 60}{3 \times 3 \times 3}$

n = 8000

542. (a)



Given that AC = 24 and BD = 10

Because it is rhombus diagonal will bisect each other at right angle.

$\therefore$ AO = OC = 12

and BO = OD = 5

In triangle AOB, $\angle BOA = 90$

$AB^2 = 12^2 + 5^2 = 144 + 25$

$AB = \sqrt{169}$

$\boxed{AB = 13}$

Perimeter of rhombus

= 13 × 4 = 52 cm

543. (d) Volume of sphere $(V_1) = \frac{4}{3}\pi r^3$

Volume of circular cylinder (V_2)

$= \pi r^2 h$

then

$\frac{4}{3}\pi r^3 = \pi r^2 h$

$\frac{h}{r} = \frac{4}{3}$

544. (b) $\because$ 1dm = 10 cm

3.2 dm = 32 cm

According to question,

$\pi r^2 h = 44a^3$

$h = \frac{44a^3}{\pi r^2}$

$h = \frac{44 \times 8 \times 8 \times 8}{\frac{22}{7} \times 32 \times 32}$

h = 7 cm

545. (b) Volume of solid sphere having radius 9 cm $= \frac{4}{3}\pi (9)^3$

Volume of right circular cylinder $= \pi (6)^2 \times h$

Then,

$\frac{4}{3}\pi (9)^3 = \pi (6)^2 \times h$

$h = \frac{9 \times 9 \times 9 \times 4}{3 \times 6 \times 6} = 27$ cm

546. (c) $l^2 = 14^2 + \left(\frac{21}{2}\right)^2$

$= 196 + \frac{441}{4}$

$l^2 = \frac{1225}{4}$

$l = \frac{35}{2}$

curved surface area = $\pi r l$

$= \frac{22}{7} \times \frac{21}{2} \times \frac{35}{2}$

Total cost $= \frac{22}{7} \times \frac{21}{2} \times \frac{35}{2} \times 6$

= 3465

547. (d) n = 1000

According to the question,

$n \times \frac{4}{3}\pi r^3 = \frac{4}{3}\pi R^3$

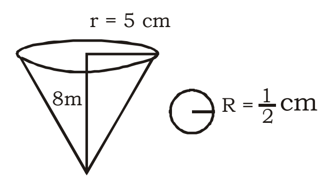
$1000 \times 3^3 = R^3$

$R^3 = 3^3 \times 10^3$

R = 30

diameter = 2R = 60

548. (a)



25% of (Volume of cone)

= x × volume of sphere

$\frac{1}{4} \times \frac{1}{3}\pi r^2 h = x \times \frac{4}{3}\pi R^3$

$\frac{1}{4} \times \frac{1}{3}\pi \times 5 \times 5 \times 8$

$= x \times \frac{4}{3}\pi \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$

$x = 100$

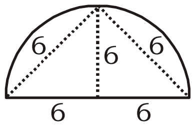
549. (c) $\frac{4}{3}\pi R^3 = \frac{1}{3}\pi R^2 H$

4R = H

4 × 5 = H

H = 20

550. (a)



The area of Largest $\triangle$ = $\frac{1}{2} \times b \times h$

$\Rightarrow \frac{1}{2} \times 12 \times 6$

$\Rightarrow$ 36 cm^2

551. (d) Let length and breadth of rectangle is a and b perimeter = 2(a + b) = 34

a + b = 17

Area = ab = 60

Length of diogonal = $\sqrt{a^2+b^2}$

= $\sqrt{(a+b)^2-2ab}$ = $\sqrt{(17)^2-120}$

= $\sqrt{289-120}$ = $\sqrt{169}$ = 13 cm

552. (c) In this condition always square area is greater than any other quadilateral

So, option (c) is correct

553. (a) Diagonal of cuboid

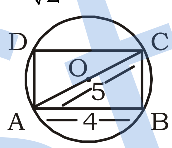
= $\sqrt{a^2+b^2+c^2}$

D = $\sqrt{5^2+4^2+3^2}$

= $\sqrt{25+16+9}$ = $\sqrt{50}$

D = $5\sqrt{2}$

554. (b)



diameter of circle = AC = 5

diagonal of rectangle = AC = 5

Let AB = 4

then BC^2 = $\sqrt{AC^2-AB^2}$

= $\sqrt{5^2-4^2}$ = $\sqrt{25-16}$

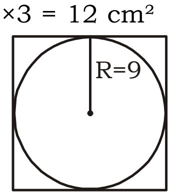
= $\sqrt{9}$ =3

BC = 3

Area of rectangle = AB×BC

= 4×3 = 12 cm^2

555. (a)



Vol = $\frac{4}{3}\pi R^3$

= $\frac{4}{3} \times \pi \times 9 \times 9 \times 9$

= 972π

556. (a) According to question,

$\frac{\pi X^2}{\pi Y^2} = \frac{G}{W}$ also given

W – G = W^1

$\frac{X^2}{Y^2} = \frac{G}{W}$

$\frac{X^2}{Y^2} = 1 - \frac{G}{W} - 1$

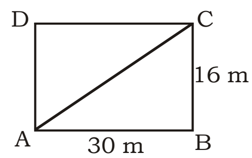
$\frac{X^2}{Y^2} = \frac{W-G}{W} - 1$

$-\frac{X^2}{Y^2} = 1 - \frac{W^1}{W}$

$\frac{X^4}{Y^4} = \left(1-\frac{w^1}{w}\right)^2$

$\frac{X}{Y} = \sqrt{1-\frac{w^1}{w}}$

557. (b)



AC = $\sqrt{AB^2+BC^2}$ = $\sqrt{30^2+16^2}$

= $\sqrt{900+256}$

= $\sqrt{1156}$ = 34 metre.

Distance travelled by elephant = 34 – 4 = 30 metre

speed of elephant = $\frac{30}{15}$

= **2 m/s**

558. (c) vol. = $\sqrt{A_1 \times A_2 \times A_3}$

= $\sqrt{12 \times 15 \times 20}$

= $\sqrt{4 \times 3 \times 5 \times 3 \times 5 \times 4}$

= 4×3×5

vol. = 60 cm^3

559. (c) Perimeter of park = speed × time = $12 \times \frac{8}{60}$

= $\frac{8}{5}$ km = 1600 m

Let length and breadth are = $3x$, $2x$

so, perimeter = $2(3x+2x)$

$\because$ 1600 = $10x$

x = 160

so, area = $3x \times 2x$

= 3 × 160 × 2 × 160

= 153600 m^2

560. (d) curved surface area = $2\pi rh$

% change = $25 - 25 - \frac{25 \times 25}{100}$

change = – 6.25% (decrease)

Alternate:-

25% = $\frac{1}{4}$

before Now

r → 4 3

h → 4 5

Area 16 = 15

–1

% change = $\frac{-1}{16} \times 100$

= –6.25% (decrease)

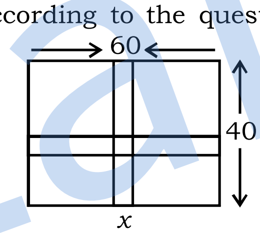
561. (c) Required vol. removed

= $\pi r^2h - \frac{1}{3}\pi r^2h = \frac{2}{3}\pi r^2h$

= $\frac{2}{3} \times \frac{22}{7} \times .6 \times .6 \times 1.4 = 1.056\ cm^3$

562. (a) Let width = x m

According to the questions



Area of rectangle – Area of road = 2109

60 × 40 – [60 × x + 40x – x^2] = 2109

2400 – [100x – x^2]= 2109

x^2 – 100x = – 291

x^2 – 100x + 291 = 0

x^2 – (97 + 3)x+ 291 = 0

x^2 – 97x – 3x + 291 = 0

x(x – 97) – 3(x–97) = 0

(x – 3) (x – 97) = 0

If x – 3 = 0

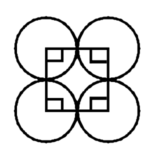
x = 3m

563. (a) Radius of each circle

= $\frac{140}{2}$ = 70

Area endosed by four circle

= $4 \times \left[\frac{90}{360}\pi r^2\right]$



= $4 \times \frac{1}{4} \times \frac{22}{7} \times 70 \times 70$ = 15400

$\because$ Area of square = 140 × 140
= 19600

$\therefore$ Area of space enclosed between the square and circumference of circle = 19600 – 15400 = 4200 cm²

564. (d) $2\pi r = 8.8$ m

$2\times\frac{22}{7}\times r = 8.8$ m

r = 1.4 m

$2\pi r \times h = 17.6$ m²

8.8 × h = 17.6

h = 2m

Now, vol = $\pi r^2 h$

$= \frac{22}{7}\times 1.4\times 1.4\times 2 = 12.32$ m³

565. (d) No. of bottles

$= \frac{\text{vol.of hemisphere}}{\text{vol.of cylinder}}$

$= \frac{\frac{2}{3}\pi R^3}{\pi r^2 h} = \frac{2\times 9\times 9\times 9}{3\times\frac{3}{2}\times\frac{3}{2}\times 4} = 54$

566. (d) Let the water, h mtr. will rise in the tank

l × b × h = Area × speed × time

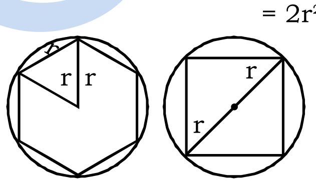
$80\times 40\times h = \frac{40}{100\times 100}\times 10000\times\frac{1}{2}$

$h = \frac{1}{160}$ m $= \frac{100}{160}$ cm $= \frac{5}{8}$ cm

567. (c) diagonal of square = $\sqrt{2}$ a
= 2r

$\therefore$ a = $\sqrt{2}$ r

area of square = a² = $\left(\sqrt{2}r\right)^2$
= 2r²



Side of hexagon = a = r

area of hexagon = $6\frac{\sqrt{3}}{4}$a²

$= 3\frac{\sqrt{3}}{2}\times r^2$

required ratio = 2r² : $\frac{3\sqrt{3}}{2}$ r²

= 4 : $3\sqrt{3}$

568. (c) Given curved S.A = $\frac{2}{3}$ Total S.A

$(2\pi rh) = \frac{2}{3}(2\pi r(r+h)$

$h = \frac{2}{3}(r+h)$

3h = 2r + 2h

h = 2r ....(i)

$2\pi r(r+h) = 231$ (given)

$2\pi r(r+2r) = 231$

$2\pi r(3r) = 231$

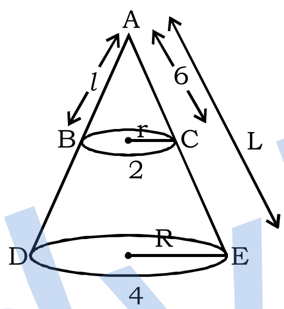
$2\times\frac{22}{7}\times r\times 3\times r = 231$

$r = \frac{7}{2}$

vol. = $\pi r^2 h = \pi r^2(2r)$

$= \frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}\times(2\times\frac{7}{2}) = 269.5$

569. (c)



Base Ar. = 16π

$\pi R^2 = 16\pi$

R = 4

Given r = 2

$\because \triangle ABC \cong \triangle ADE$

$\therefore \frac{BC}{DE} = \frac{AC}{AE}$

$\frac{4}{8} = \frac{6}{AE}$ = AE = 12 = L

Surface Area of frustum

$= \pi RL - \pi rl$

$= \pi\times 4\times 12 - \pi\times 2\times 6$

$= 48\pi - 12\pi$

$= 36\pi$

570. (c) Let diameter are d_1 & d_2

According to the question

$d_1 = 2d_2$ ....(i) and

$4\pi\left(\frac{d_1}{2}\right)^2 = \frac{4\pi}{3}\left(\frac{d_2}{2}\right)^3$ (given)

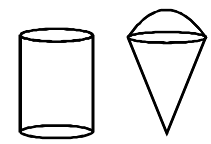
$\frac{(d_1)^2}{4} = \frac{1}{3}\left(\frac{d_1}{2\times 2}\right)^3$

$d_1^2 = \frac{4}{3}\times\frac{d_1^3}{64}$

$d_1 = 48$

$r_1 = \frac{d_1}{2} = \frac{48}{2} = 24$

571. (a) Let total no. of required cone = n



n×vol. of (cone + hemisphare) = vol. of cylinder

$n\times[\frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3] = \pi R^2 H$

$n\times\frac{1}{3}\pi r^2[h+2r] = \pi R^2 H$

$n\times\frac{1}{3}\times\frac{7}{2}\times\frac{7}{2}[12 + 2\times\frac{7}{2}]$

$= \frac{21}{2}\times\frac{21}{2}\times 38$

$n\times\frac{1}{3}[19] = 3\times 3\times 38$

n = 54

572. (a) Volume of bigger cube

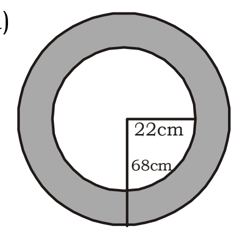
= 6³ + 8³ + 10³

= 216 + 512 + 1000 = 1728

Side of bigger cube = $\sqrt[3]{1728}$

= 12 cm

573. (a)



Area bounded by two circle is

$= \pi R^2 - \pi r^2 = \pi(68^2 - 22^2)$

$= \pi(68 + 22)\times(68 - 22)$

$= \pi 90\times 46 = 4140\pi$ sq.cm.

574. (d) Volume of sphere = volume of wire.

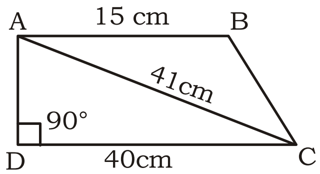
$\frac{4}{3}\pi r_s^3 = \pi r_w^2 h$

$h = \frac{\frac{4}{3}\times\pi\times 6^3}{\pi 0.2\times 0.2}$

$h = \frac{4\times 6\times 6\times 6}{3\times 0.2\times 0.2}$

= 7200 cm = 72m.

575. (c)



In $\triangle$ ADC, $\angle$D = 90

$\therefore$ $AC^2 = CD^2 + AD^2$

$AD^2 = 41^2 - 40^2$

$AD^2 = 1681 - 1600$

$AD = \sqrt{81}$

$\boxed{AD = 9}$

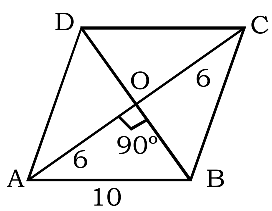
Area of trapezium

$= \frac{1}{2}(AB + CD).\ AD$

$= \frac{1}{2}(40 + 15)9 = \frac{1}{2} \times 55 \times 9$

$= \frac{495}{2} = 247.5 cm^2$

576. (b)



We know that diagonal of rhombus bisect each other at 90°

$\therefore$ $AB^2 = AO^2 + OB^2$

$OB^2 = 10^2 - 6^2 = 100 - 36$

$OB^2 = 64$

$\boxed{OB = 8}$

BD = 16

Area of rhombus $= \frac{1}{2} d_1 d_2$

$= \frac{1}{2} \times 12 \times 16 = 96 cm^2$

577. (c) According to question,

Area × rate = expenditure

$\pi r^2 \times \frac{1}{2} =$ ₹ 7700

$r^2 = \frac{7700 \times 7}{22} \times 2$

$\boxed{r = 70}$

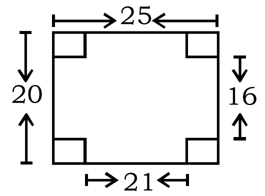
perimeter $= 2\pi r = 2 \times \frac{22}{7} \times 70$

= 440 metre

Expenditure = 440 × 1.20

= ₹ 528

578. (b)



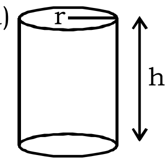
Now, $l = 21$, b = 16, h = 2

vol. $= l \times b \times h$

$= 21 \times 16 \times 2$

$= 21 \times 32 = 672 cm^3$

579. (a)



h = 4cm

$2\pi r(h+r) = 8\pi cm^2$

$r(h+r) = 4$

$r(4+r) = 4$

$4r + r^2 = 4$

$r^2 + 4r - 4 = 0$

$r = \frac{-4 \pm \sqrt{16+16}}{2} = \frac{-4 \pm 4\sqrt{2}}{2}$

$= -2 \pm 2\sqrt{2}$

$r = (2\sqrt{2} - 2)cm$

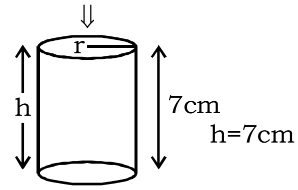
580. (a) T.S.A = surface area + total area of n surfaces

340 = 100 + n × 30

240 = 30n

n = 8

581. (c) r=2.1dm
=21cm   1dm = 10cm
⇓



$\frac{4}{3}\pi R^3 = \pi r^2 h$

$\frac{4}{3}\pi \times 21 \times 21 \times 21 = \pi \times R^2 \times 7$

$R^2 = 21 \times 21 \times 4$

R = 42 cm

$\frac{\text{total surface area of rod}}{\text{total surface area of sphere}}$

$= \frac{2\pi r(R+r)}{4\pi r^2} = \frac{42(42+7)}{2 \times 21 \times 21}$

$= \frac{49}{21} = \frac{7}{3} = 7 : 3$

582. (a) Let length of rectangle = x

then breadth of rectangle = 6 – x

Area of rectangle = x(6 –x)

Diagonal of rectangle(y)

$= \sqrt{x^2 + (6 - x)^2}$

$= \sqrt{x^2 + 36 + x^2 - 12x}$

$\boxed{y = \sqrt{2x^2 - 12x + 36}}$

Now square of side is equal to diagonal.

So, Area of square = y^2

$= 2x^2 - 12x + 36$

$\frac{2x^2 - 12x + 36}{x(6-x)} = \frac{5}{2}$

$4x^2 - 24x + 72 = 30x - 5x^2$

$9x^2 - 54x + 72 = 0$

$9x^2 - 18x - 36x + 72 = 0$

$9x(x - 2) - 36(x - 2)$

$9x(x - 2) - 36(x - 2)$

$(x - 2)(9x - 36) = 0$

x = 2, x = 4

We get two value

By putting x = 2 and x = 4 in Area of square $2x^2 - 12x + 36$ we get the area = 20 cm^2

583. (b) Side of equilateral $\triangle$ = a cm

In circle radius $= \frac{a}{2\sqrt{3}}$

$= \frac{8}{2\sqrt{3}} = \frac{4}{\sqrt{3}}$

Circum radius $= \frac{a}{\sqrt{3}} = \frac{8}{\sqrt{3}}$

Area bounded by both circle is

$= \pi\left(\left(\frac{8}{\sqrt{3}}\right)^2 - \left(\frac{4}{\sqrt{3}}\right)^2\right)$

$= \frac{22}{7}\left(\frac{64}{3} - \frac{16}{3}\right) = \frac{22}{7}\left(\frac{48}{3}\right)$

$= \frac{22 \times 16}{7} = 50\frac{2}{7}\ cm^2.$

584. (a) Volume of Both solids should be equal

$\therefore \frac{4}{3}\pi r_s^3 = \pi(R^2 - r^2)h$

$\frac{4}{3}\times 3^3 = (5^2 - r^2)4$

$4 \times 9 = (25 - r^2)4$

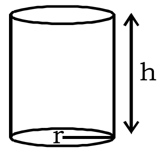
$25 - r^2 = 9$

$r^2 = 16$

$\boxed{r = 4}$

thickness of tube = 5 – 4 =1cm

585. (c)



r+h = 20 ...(i)

T.S.A = 880

$2\pi r(h+r) = 880$

$2\times\frac{22}{7}\times r\times 20 = 880$

r = 7

h = 13

vol. = $\pi r^2 h$

$= \frac{22}{7}\times 7\times 7\times 13$

$= 154 \times 13 = 2002$ cm³

586. (b) Ratio of sides = $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$

= 6 : 4 : 3

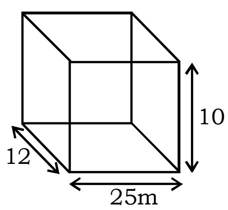
(6 + 4 + 3) → 104

13 → 104

1 → 8

6 → 8 × 6 = 48

587. (b)



Total painted area

= roof + and side walls

= (25×12) + 2(12×10+25×10)

= 300 + 240 + 500 = 1040

A painted in 5 days area is 200 m²

1 day → 40 m²

B's 2 day area ⇒ 250 m²

1 → 125 m²

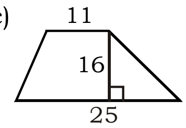
(A+B) 1 day painted area

= 40 + 125 = 165

time by (A+B) to paint total area

$= \frac{1040}{165} = 6\frac{10}{33}$ days

588. (c)



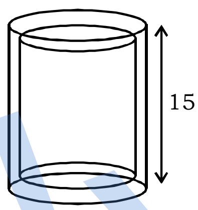
Volume of prism

= Base area × height

$= \frac{1}{2}(25+11)\times 16\times 10$

= 18×16×10 = 2880 cm³

589. (a)



Volume of cylinder

$= \pi r_1^2 h - \pi r_2^2 h$

$= \pi h(r_1^2 - r_2^2)$

$= \pi h(r_1+r_2)(r_1-r_2)$

$= \frac{22}{7}\times 15\times(6.75+5.25)(6.75-5.25)$

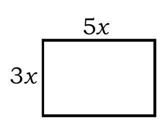
$= \frac{22}{7}\times 15\times 12\times 1.5$

Vol. $= \pi r_3^2 \frac{h}{2} = \frac{22}{7}\times 15\times 12\times 1.5$

$r_3^2\times\frac{15}{2} = 15\times 12\times 1.5$

$r_3 = 6$

590. (b)



$2(l+b) = 2(5x+3x)$

surrounding at ₹ 7.5

So, $2(5x+3x)\times 7.5 = 6000$

$8x\times 15 = 6000$

$x = \frac{400}{8}$

$x = 50$

$l = 5 \times x = 5 \times 50 = 250$

$b = 3x = 3 \times 50 = 150$

$(l-b) = 250 - 150 = 100$

591. (a) In triangle, perimeter

= 3a = 132, a = 44

So, area = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4}44\times 44$

$= 484\sqrt{3}$ ....(i)

square, perimeter 4a = 132

a = 33

So, area = a² = (33)² = 1089

Circle perimeter = $2\pi r = 132$

$2\times\frac{22}{7}r = 132$

So, r = 21

Now, area = $\pi r^2 = \frac{22}{7}\times 21\times 21$

= 1386

So, area of circle will be longest shape

592. (d) Each interior angle of polygon is given by

$= \frac{(x-2)}{x}\times 180$

sides is a, 2a

$\frac{\left(\frac{a-2}{a}\right)\times 180}{\left(\frac{2a-2}{2a}\right)\times 180} = \frac{3}{4}$

$\frac{(a-2)}{a}\times\frac{2a}{2(a-1)} = \frac{3}{4}$

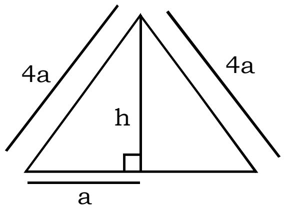
$\frac{(a-2)}{(a-1)} = \frac{3}{4}$

4a – 8 = 3a – 3

a = 5

So, sides 5,10

593.(c)



h = $\sqrt{(4a)^2-(a)^2}$

h = $\sqrt{16a^2-a^2}$

h = $\sqrt{15a^2}$

h = $a\sqrt{15}$

area = $\frac{1}{2}\times 2a\times h$

= $\frac{1}{2}\times 2a\times a.\sqrt{15}$

perimeter of equilateral triangle is

= 4a + 4a + 2a = 10a

each side of triangle = $\frac{10}{3}a$

area of equilateral triangle

= $\frac{\sqrt{3}}{4}\times\frac{10}{3}\times\frac{10}{3}\times a^2$

$\frac{25\sqrt{3}}{9}a^2$

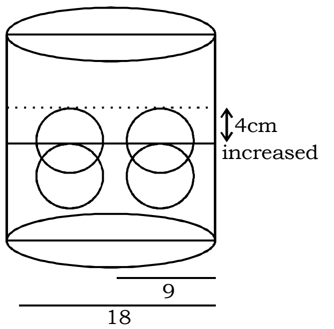
$\frac{\text{area of isosceles}\Delta}{\text{area of equilateral}\Delta}$

= $\frac{\frac{1}{2}\times 2a\times a\sqrt{15}}{\frac{25}{9}\sqrt{3}a^2}$

= $\left(\frac{9\times\sqrt{3}\times\sqrt{5}}{25\times\sqrt{3}}\right)\times\frac{4}{4}$

= $36\sqrt{5}$: 100

594. (c)



total volume of 2 balls = volume of cylinder of height = 4 cm

$\frac{4}{3}\pi r_1^3+\frac{4}{3}\pi r_2^3=\pi 9^2\times 4$

$r_1 = 2r_2$ given

$\frac{4}{3}\pi(8r_2^3+r_2^3)=\pi\times 9\times 9\times 4$

$9r_2^3 = 9\times 9\times 3$

$r_2 = 3$

$r_1 = 2r_2 = 2\times 3 = 6$