

SIMPLIFICATION

EXERCISE

YEAR : 1999

1. Simplify: $1 + \frac{1}{1 + \frac{2}{2 + \frac{3}{1 + \frac{4}{5}}}}$

- (a) $1\frac{11}{17}$ (b) $1\frac{5}{7}$
(c) $1\frac{6}{17}$ (d) $1\frac{21}{17}$

2. Simplify : $1 + \frac{2}{1 + \frac{3}{1 + \frac{4}{1 + \frac{5}{5}}}}$

- (a) $\frac{7}{4}$ (b) $\frac{4}{7}$
(c) $\frac{7}{5}$ (d) $\frac{3}{7}$

3. Evaluate:

$$\frac{9 \div 3 - 5 \mid -5 \mid 4 \mid \div 10}{-3(5) - 2 \times 4 \div 2}$$

- (a) $\frac{9}{10}$ (b) $-\frac{8}{17}$
(c) $-\frac{16}{19}$ (d) $\frac{4}{7}$

4. $5 - [4 - \{3 - (3 - 3 - 6)\}]$ is equal to:

- (a) 10 (b) 6 (c) 4 (d) 0

5. Evaluate:

$$\frac{-(4-6)^2 - 3(-2) + |-6|}{18 - 9 \div 3 \times 5}$$

- (a) $\frac{3}{8}$ (b) $\frac{4}{7}$
(c) $\frac{8}{3}$ (d) $\frac{7}{4}$

6. Simplify:

$$\frac{\frac{5}{3} \times \frac{7}{51} \text{ of } \frac{17}{5} - \frac{1}{3}}{\frac{2}{9} \times \frac{5}{7} \text{ of } \frac{28}{5} - \frac{2}{3}}$$

- (a) $\frac{1}{2}$ (b) 4 (c) 2 (d) $\frac{1}{4}$

7. $1 - [5 - \{2 + (-5 + 6 - 2)2\}]$ is equal to

- (a) -4 (b) 2 (c) 0 (d) -2

8. Assume that

$$\sqrt{13} = 3.605 \text{ (approximately)}$$

$$\sqrt{130} = 11.40 \text{ (approximately)}$$

Find the value of :

- (a) 36.164 (b) 36.304
(c) 37.304 (d) 37.164

9. On simplification of

$$\frac{(2.644)^2 - (2.356)^2}{0.288}$$

- (a) 1 (b) 4 (c) 5 (d) 6

10. Simplification of

$$\frac{(3.4567)^2 - (3.4533)^2}{0.0034}$$

- (a) 6.91 (b) 7
(c) 6.81 (d) 7.1

11. The value of $\frac{(0.03)^2 - (0.01)^2}{0.03 - 0.01}$

- (a) 0.02 (b) 0.004
(c) 0.4 (d) 0.04

12. What is the square root of 0.09

- (a) 0.3 (b) 0.03
(c) 0.003 (d) 3.0

13. Find the value of

$$\frac{(0.75)^3}{1 - .75} + \left[0.75 + (0.75)^2 + 1 \right]$$

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

14. $\sqrt{\frac{0.49}{0.25}} + \sqrt{\frac{0.81}{0.36}}$ is equal to:

- (a) $7\frac{9}{10}$ (b) $2\frac{9}{10}$
(c) $\frac{9}{10}$ (d) $9\frac{9}{10}$

15. If $\sqrt{x} \div \sqrt{441} = 0.02$, then value of x is:

- (a) 1.64 (b) 2.64
(c) 1.764 (d) 0.1764

16. Find the value of

$$\sqrt{4 + \sqrt{44 + \sqrt{10000}}}$$

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

17. If the square root of 841 is 29, then square root of 0.00000841 is equal to:

- (a) 0.029 (b) 0.0029
(c) 0.00029 (d) 0.29

18. The square root of a positive number less than 100 lies between:-

- (a) 0 and 1000 (b) 0 and 10
(c) -10 and 10 (d) -100 and 100

19. By which smallest number should 5808 be multiplied so that it becomes a perfect square?

- (a) 2 (b) 7 (c) 11 (d) 3

20. $\frac{\sqrt[3]{8}}{\sqrt{16}} \div \sqrt{\frac{100}{49}} \times \sqrt[3]{125}$ is equal to:

- (a) 7 (b) $1\frac{3}{4}$ (c) $\frac{7}{100}$ (d) $\frac{4}{7}$

21. By which smallest number 1323 must be multiplied, so that it becomes a perfect cube?

- (a) 2 (b) 3 (c) 5 (d) 7

YEAR : 2000

22. On simplification $3034 - (1002 \div 20.04)$ is equal to

(a) 3029 (b) 2984
(c) 2993 (d) 2543

23. When simplified, the expression

$$(100)^{\frac{1}{2}} \times (0.001)^{\frac{1}{3}} - (0.0016)^{\frac{1}{4}} \times 3^0 + \left(\frac{5}{4}\right)^{-1}$$

is equal to:

(a) 1.6 (b) 0.8 (c) 1.0 (d) 0

24. When $\left(\frac{1}{2} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6}\right)$ is divided by

$$\left(\frac{2}{5} - \frac{5}{9} + \frac{3}{5} - \frac{7}{18}\right), \text{ the result is:}$$

(a) $5\frac{1}{10}$ (b) $2\frac{1}{18}$

(c) $3\frac{1}{6}$ (d) $3\frac{3}{10}$

25. $(\sqrt{72} - \sqrt{18}) \div \sqrt{12}$ is equal to:

(a) $\sqrt{6}$ (b) $\sqrt{3}/2$

(c) $\sqrt{2}/3$ (d) $\sqrt{6}/2$

26. The value of $\frac{\sqrt{80} - \sqrt{112}}{\sqrt{45} - \sqrt{63}}$

(a) $\frac{3}{4}$ (b) $1\frac{3}{4}$ (c) $1\frac{1}{3}$ (d) $1\frac{7}{9}$

27. The square root of $(272^2 - 128^2)$ is:

(a) 256 (b) 200 (c) 240 (d) 144

28. The digit at the unit's place in the square root of 15876 is :

(a) 8 (b) 6 (c) 4 (d) 2

29. If the sum of two numbers is 22 and the sum of their squares is 404, then the product of the numbers is:

(a) 40 (b) 44 (c) 80 (d) 88

30. One-third of the square root of which number is 0.001 ?

(a) 0.0009 (b) 0.000001

(c) 0.00009

(d) None of the above

31. 1008 divided by which single digit number gives a perfect square ?

(a) 9 (b) 4 (c) 8 (d) 7

32. $\sqrt[3]{\frac{72.9}{0.4096}}$ is equal to:

(a) 0.5625 (b) 5.625

(c) 182 (d) 13.6

33. $(5.5)^3 - (4.5)^3$ is equal to:

(a) 1 (b) 75

(c) 74.25 (d) 75.25

34. Which of the following is a perfect square as well as a cube ?

(a) 81 (b) 125 (c) 343 (d) 64

35. When the square of a natural number subtracted from its cube, the result is 48. Find the number:

(a) 8 (b) 6 (c) 5 (d) 4

YEAR : 2002

36. The value of $\frac{1}{3 + \frac{1}{2 - \frac{1}{\frac{7}{9}}}} + \frac{17}{22}$

(a) $\frac{12}{22}$

(b) $\frac{22}{5}$

(c) $\frac{5}{22}$

(d) 1

37. If $x = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{2}}}}$ then, the

value of $2x + \frac{7}{4}$ is :

(a) 3 (b) 4 (c) 5 (d) 6

38. Simplify:

$$\frac{19}{43} + \frac{1}{2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{4}}}}$$

(a) 1 (b) $\frac{19}{43}$ (c) $\frac{43}{19}$ (d) $\frac{38}{43}$

39. Simplify:

$$8\frac{1}{2} - \left[3\frac{1}{4} + \left\{ 1\frac{1}{4} - \frac{1}{2} \left(1\frac{1}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

(a) $4\frac{1}{2}$ (b) $4\frac{1}{6}$ (c) $9\frac{1}{2}$ (d) $\frac{2}{9}$

40. If $\frac{50}{x} = \frac{x}{12\frac{1}{2}}$, then the value of

x is:

(a) $\frac{25}{2}$ (b) $\frac{4}{25}$ (c) 4 (d) 25

41. The value of $(0.008 \times 0.01 \times 0.072) \div (0.12 \times 0.004)$

(a) 1.2 (b) 0.12

(c) 0.012 (d) 1.02

42. The value of $\frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{2}{3} \text{ of } 1\frac{1}{4}}$

(a) 2

(b) 1

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

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

43. Find the sum of the following :

$$\frac{1}{9} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72}$$

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

(b) 0

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

(d) 1

44. The value of $25 - 5[2 + 3(2 - 2(5 - 3) + 5) - 10] \div 4$

(a) 5

(b) 23.25

(c) 23.75

(d) 25

45. Find the value of * in the following

$$1\frac{2}{3} \div \frac{2}{7} \times \frac{*}{7} = 1\frac{1}{4} \times \frac{2}{3} \div \frac{1}{6}$$

(a) $\frac{1}{6}$

(b) 0.6

(c) 0.006

(d) 6

46. If $x = \frac{1}{2 + \frac{1}{2}}$ then $\frac{1}{x} = ?$

(a) $\frac{2}{5}$

(b) $\frac{5}{2}$

(c) $\frac{3}{5}$

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

47. The value of $\frac{5}{\frac{7}{8} \text{ of } 1\frac{1}{3} \times \frac{2\frac{1}{10}}{3\frac{1}{2}}} \text{ of } 1\frac{1}{4}$

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

(b) 0.05

(c) 1

(d) 2

48. $\frac{9}{20} - \left[\frac{1}{5} + \left\{ \frac{1}{4} + \left(\frac{5}{6} - \frac{1}{3} + \frac{1}{2} \right) \right\} \right]$ is equal to

- (a) 0 (b) 1 (c) $\frac{9}{20}$ (d) $\frac{9}{10}$

49. $\frac{0.83 \div 7.5}{2.321 - 0.098}$ is equal to

- (a) 0.6 (b) 0.1
(c) 0.06 (d) 0.05

50. For what value of *, statement

$\left[\frac{(*)}{21} \times \frac{(*)}{189} \right] = 1$ is correct?

- (a) 3969 (b) 147
(c) 63 (d) 21

51. The value of

$\frac{\sqrt{(0.1)^2 + (0.01)^2 + (0.009)^2}}{\sqrt{(0.01)^2 + (0.001)^2 + (0.0009)^2}}$

- (a) 10^2 (b) 10 (c) 0.1 (d) 0.01

52. The value of

$\frac{\sqrt{(0.03)^2 + (0.21)^2 + (0.065)^2}}{\sqrt{(0.003)^2 + (0.021)^2 + (0.0065)^2}}$

- (a) 0.1 (b) 10 (c) 10^2 (d) 10^3

53. The sum of

$\sqrt{0.01} + \sqrt{0.81} + \sqrt{1.21} + \sqrt{0.0009}$

- (a) 2.1 (b) 2.13 (c) 2.03 (d) 2.11

54. The value of

$\frac{\sqrt{(6.1)^2 + (61.1)^2 + (611.1)^2}}{\sqrt{(0.61)^2 + (6.11)^2 + (61.11)^2}}$

- (a) 0.1 (b) 1.1 (c) 10 (d) 100

55. The value of $\sqrt{0.000441}$ is equal to;

- (a) 0.21 (b) 0.0021
(c) 0.021 (d) 0.00021

56. The value of $\frac{\sqrt{0.441}}{\sqrt{0.625}}$ is equal to:

- (a) 0.048 (b) 0.84
(c) 0.48 (d) 0.084

57. The square root of

$\frac{0.342 \times 0.684}{0.000342 \times 0.000171}$

- (a) 250 (b) 2500
(c) 2000 (d) 4000

58. $\sqrt{0.00060516}$ is equal to

- (a) 0.0246 (b) 0.00246
(c) 0.246 (d) 0.000246

59. The square root of $\frac{9.5 \times 0.085}{0.017 \times 0.019}$

- (a) 0.5 (b) 5 (c) 50 (d) 500

60. Find the value of

$\sqrt{248 + \sqrt{52 + \sqrt{144}}}$

- (a) -16 (b) ± 16
(c) 16 (d) 16.2

61. If $(102)^2 = 10404$ then, the value of

$\sqrt{104.04} + \sqrt{1.0404} + \sqrt{0.010404}$ is equal to

- (a) 0.306 (b) 0.0306
(c) 11.122 (d) 11.322

62. If $\sqrt{4096} = 64$, then the value of

$\sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$ up to two place of decimals is:-

- (a) 7.09 (b) 7.10
(c) 7.11 (d) 7.12

63. Three fifth of the square of a certain number is 126.15, What is the number?

- (a) 210.25 (b) 75.69
(c) 14.5 (d) 145

64. The least number that must be subtracted from 63522 to make the result a perfect square is :

- (a) 18 (b) 20 (c) 24 (d) 30

65. By which smallest number should 20184 be multiplied so that it becomes a perfect square?

- (a) 2 (b) 3 (c) 5 (d) 6

66. If cube root of 175616 is 56, then the value of

$\sqrt[3]{175.616} + \sqrt[3]{0.175616} + \sqrt[3]{0.000175616}$ is equal to:

- (a) 0.168 (b) 62.16
(c) 6.216 (d) 6.116

YEAR 2003

67. The simplification of $\frac{5}{3 + \frac{3}{1 - \frac{2}{3}}}$

- (a) 5 (b) $\frac{5}{3}$ (c) $\frac{5}{12}$ (d) $\frac{3}{5}$

68. If $2 = x + \frac{1}{1 + \frac{1}{3 + \frac{1}{4}}}$, then the

value of x is:

- (a) $\frac{18}{17}$ (b) $\frac{21}{17}$ (c) $\frac{13}{17}$ (d) $\frac{12}{17}$

69. Find the value of

$\frac{2}{1 + \frac{1}{1 - \frac{1}{2}}} \times \frac{3}{\frac{5}{6} \text{ of } \frac{3}{2} \div 1\frac{1}{4}}$

- (a) 6 (b) 8 (c) 4 (d) 2

70. Simplify:

$1 + \frac{4}{2 + \frac{3}{5 - \frac{1}{2}}} - \frac{1}{2}(10 \div 2)$

- (a) 1 (b) 0
(c) $-\frac{15}{2}$ (d) $-\frac{1}{2}$

71. Simplify:

$\left[\left(1 + \frac{1}{10 + \frac{1}{10}} \right) \times \left(1 + \frac{1}{10 + \frac{1}{10}} \right) - \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \times \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right] \div \left[\left(1 + \frac{1}{10 + \frac{1}{10}} \right) + \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right]$

- (a) $\frac{100}{101}$ (b) $\frac{90}{101}$ (c) $\frac{20}{101}$ (d) $\frac{101}{100}$

72. If $\frac{1120}{\sqrt{p}} = 80$, then P is equal to

- (a) 14 (b) 140 (c) 196 (d) 225

73. $\frac{3\frac{1}{4} - \frac{4}{5} \text{ of } \frac{5}{6}}{4\frac{1}{3} \div \frac{1}{5} - \left(\frac{3}{10} + 21\frac{1}{5} \right)} - \left(1\frac{2}{3} \text{ of } 1\frac{1}{2} \right)$ is

equal to

- (a) 9 (b) $11\frac{1}{2}$ (c) 13 (d) $15\frac{1}{2}$

74. Simplify

$\left[3\frac{1}{4} \div \left\{ 1\frac{1}{4} - \frac{1}{2} \left(2\frac{1}{2} - \frac{1}{4} - \frac{1}{6} \right) \right\} \right] \div \left(\frac{1}{2} \text{ of } 4\frac{1}{3} \right)$

- (a) 18 (b) 36 (c) 39 (d) 78

75. The value of

$$\frac{(0.1)^3 + (0.2)^3 + (0.3)^3 - 3 \times 0.1 \times 0.2 \times 0.3}{(0.1)^2 + (0.2)^2 + (0.3)^2 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1}$$

- (a) 0.006 (b) 0.6
(c) 0 (d) 0.2

76. $\frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90} + \frac{1}{110} = ?$

- (a) $\sqrt{2} \frac{2}{27}$ (b) $\frac{1}{9}$
(c) $\frac{5}{27}$ (d) $\frac{6}{55}$

77. If $I = \frac{3}{4} \div \frac{5}{6}$, $II = 3 \div [(4 \div 5) \div 6]$,
 $III = [3 \div (4 \div 5)] \div 6$, $IV = 3 \div 4 (5 \div 6)$ then

- (a) I and II are equal
(b) I and IV are equal
(c) I and III are equal
(d) All are equal

78. The value of $1 \div [1 + 1 \div \{1 + 1 \div (1 + 1 \div 2)\}]$

- (a) 1 (b) $\frac{5}{8}$ (c) 2 (d) $\frac{1}{2}$

79. The simplified value of

$$\frac{\frac{1}{3} \div \frac{1}{3} \times \frac{1}{3}}{\frac{1}{3} \div \frac{1}{3} \text{ of } \frac{1}{3}} - \frac{1}{9} \text{ is equal to:}$$

- (a) 0 (b) 1 (c) $\frac{1}{3}$ (d) $\frac{1}{9}$

80. Simplify:

$$2\frac{3}{4} \div \frac{7}{8} \times \left(\frac{1}{3} + \frac{1}{4}\right) + \frac{5}{7} \div \frac{3}{4} \text{ of } \frac{3}{7}$$

- (a) $\frac{56}{77}$ (b) $\frac{49}{80}$ (c) $\frac{2}{3}$ (d) $3\frac{2}{9}$

81. The simplification of

$$3.\overline{36} - 2.\overline{05} + 1.\overline{33} \text{ equals:}$$

- (a) 2.60 (b) $2.\overline{61}$
(c) 2.64 (d) $2.\overline{64}$

82. The value of

$$0.9 \times 0.9 \times 0.9 + 0.2 \times 0.2 \times 0.2 + 0.3 \times 0.3$$

$$\frac{\times 0.3 - 3 \times 0.9 \times 0.2 \times 0.3}{0.9 \times 0.9 + 0.2 \times 0.2 + 0.3 \times 0.3 - 0.9 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.9}$$

(a) 1.4 (b) 0.054 (c) .8 (d) 1.0

83. Simplify:

$$(0.\overline{1})^2 \left\{ 1 - 9(0.\overline{16})^2 \right\}$$

- (a) $-\frac{1}{162}$ (b) $\frac{1}{108}$
(c) $\frac{7696}{10^6}$ (d) $\frac{1}{109}$

84. Simplify:

$$\frac{1 + \frac{1}{2}}{1 - \frac{1}{2}} \div \frac{4}{7} \left(\frac{2}{5} + \frac{3}{10} \right) \text{ of } \frac{\frac{1}{2} + \frac{1}{3}}{\frac{1}{2} - \frac{1}{3}}$$

- (a) $\frac{2}{3}$ (b) $37\frac{1}{2}$
(c) $\frac{3}{2}$ (d) $13\frac{3}{8}$

85. Simplify:

$$[0.9 - \{2.3 - 3.2 - (7.1 - 5.4 - 3.5)\}]$$

- (a) 0.18 (b) 1.8
(c) 0 (d) 2.6

86. $(32)^3 + (79)^3 - (111)^3 + 3 \times 32 \times 79 \times 111$ is equal to

- (a) 10000 (b) 0
(c) 30007 (d) 1

87. $\left(\frac{5}{2} + \frac{3}{2}\right) \left(\frac{25}{4} - \frac{15}{4} + \frac{9}{4}\right)$ is equal to

- (a) 38 (b) 19 (c) 37 (d) 36

88. $(0.2 \times 0.2 + 0.01)(0.1 \times 0.1 + 0.02)^{-1}$ is equal to

- (a) $\frac{5}{3}$ (b) $\frac{41}{12}$ (c) $\frac{41}{4}$ (d) $\frac{9}{5}$

89. $\frac{1}{2} + \left\{ 4\frac{3}{4} - \left(3\frac{1}{6} - 2\frac{1}{3} \right) \right\}$ is equal to

- (a) $3\frac{2}{3}$ (b) $1\frac{1}{4}$
(c) $4\frac{5}{12}$ (d) $1\frac{2}{3}$

90. The simplification of

$$\frac{1}{8} + \frac{1}{8^2} + \frac{1}{8^3} + \frac{1}{8^4} + \frac{1}{8^5} \text{ upto three -}$$

- place of decimals yields
(a) 0.143 (b) 0.163
(c) 0.215 (d) 0.715

91. Simplify:

$$\sqrt{[(12.1)^2 - (8.1)^2] \div [(0.25)^2 + (0.25)(19.95)]}$$

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

92. The value of

$$\frac{0.051 \times 0.051 \times 0.051 + 0.041 \times 0.041 \times 0.041}{0.051 \times 0.051 - 0.051 \times 0.041 + 0.041 \times 0.041}$$

- (a) 0.92 (b) 0.092
(c) 0.0092 (d) 0.00092

93. The value of

$$\sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + \sqrt{49}}}}}$$

- (a) 3 (b) 9 (c) 7 (d) 5

94. The value of $\frac{(75.8)^2 - (55.8)^2}{20}$

- (a) 20 (b) 40
(c) 121.6 (d) 131.6

95. The value of $\frac{4 - \sqrt{0.04}}{4 + \sqrt{0.4}}$ is close to

- (a) 0.4 (b) 0.8 (c) 1.0 (d) 1.4

96. $\sqrt{0.00004761}$ equal to

- (a) 0.069 (b) 0.0069
(c) 0.00069 (d) 0.0609

97. If $\sqrt{2} = 1.414$, the value of

$$\frac{\sqrt{2} - 1}{\sqrt{2} + 1} \text{ is nearest to}$$

- (a) 0.172 (b) 0.414
(c) 0.586 (d) 1.414

98. $\sqrt{\frac{0.00001225}{0.00005329}}$ is equal to :

- (a) $\frac{25}{77}$ (b) $\frac{35}{73}$ (c) $\frac{35}{77}$ (d) $\frac{25}{73}$

99. Given that $\sqrt{574.6} = 23.97$,

$$\sqrt{5746} = 75.8 \text{ then } \sqrt{0.00005746}$$

- (a) 0.002397 (b) 0.0002397
(c) 0.0007580 (d) 0.00758

100. $\sqrt{(0.798)^2 + 0.404 \times 0.798 + (0.202)^2} + 1 = ?$

- (a) 0 (b) 2
(c) 1 (d) 0.404

101. The value of $\sqrt{11.981 + 7\sqrt{1.2996}}$ is closest to

- (a) 5.1 (b) 4.9 (c) 4.5 (d) 4.1

102. How many positive integers less than 1000 are multiples of 11 whose square roots are whole numbers

- (a) 2 (b) 4
(c) 8 (d) 11

103. What is the least number which should be subtracted from 0.000326, to have perfect square?

- (a) 0.000004 (b) 0.000002
(c) 0.04 (d) 0.02

104. The value of $\sqrt[3]{\frac{7}{875}}$ is equal to

- (a) $\frac{1}{3}$ (b) $\frac{1}{15}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

105. Sum of digits of the smallest number by which 1440 be multiplied so that it becomes a perfect cube, is

- (a) 4 (b) 6 (c) 7 (d) 8

106. The least possible value of A for which $90 \times A$ is a perfect cube is

- (a) 200 (b) 300 (c) 500 (d) 600

YEAR 2004

107. $\frac{5\frac{9}{14}}{5 + \frac{1}{3 + \frac{1}{\frac{5}{3}}}}$ is equal to:

- (a) 1 (b) 1.5 (c) 2 (d) 2.5

108. $\frac{2}{2 + \frac{2}{3 + \frac{2}{3 + \frac{2}{3}}}} \times 0.39$ is simplified to:

- (a) $\frac{1}{3}$ (b) 2
(c) 6 (d) None of these

109. $1 + \frac{1}{1 + \frac{1}{2}}$ is equal to:

- (a) 3 (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) $\frac{5}{3}$

110. $8.7 - [7.6 - \{6.5 - (5.4 - \overline{4.3 - 2})\}]$ is simplified to:

- (a) 2.5 (b) 3.5 (c) 4.5 (d) 5.5

111. The simplified value of $[(0.111)^3 + (0.222)^3 - (0.333)^3 + (0.333)^2(0.222)]^3$

- (a) 0.999 (b) 0
(c) 0.888 (d) 0.111

112. $\frac{1\frac{1}{4} \div 1\frac{1}{2}}{\left(\frac{1}{15} + 1 - \frac{9}{10}\right)}$ is equal to:

- (a) 3 (b) 6 (c) $\frac{2}{5}$ (d) 5

113. $\frac{-\frac{1}{2} - \frac{2}{3} + \frac{4}{5} - \frac{1}{3} + \frac{1}{5} + \frac{3}{4}}{\frac{1}{2} + \frac{2}{3} - \frac{4}{3} + \frac{1}{3} - \frac{1}{5} - \frac{4}{5}}$ is simplified to

- (a) $-\frac{10}{3}$ (b) $-\frac{3}{10}$
(c) 1 (d) -2

114. The simplification of $(\overline{0.63} + \overline{0.37} + \overline{0.80})$ yields the result

- (a) $\overline{1.80}$ (b) $\overline{1.81}$
(c) $\overline{1.79}$ (d) $\overline{1.80}$

115. $\frac{(4.53 - 3.07)^2}{(3.07 - 2.15)(2.15 - 4.53)} +$

$\frac{(3.07 - 2.15)^2}{(2.15 - 4.53)(4.53 - 3.07)} +$

$\frac{(2.15 - 4.53)^2}{(4.53 - 3.07)(3.07 - 2.15)}$

is simplified to

- (a) 0 (b) 1 (c) 2 (d) 3

116. $\frac{17}{15} \times \frac{17}{15} + \frac{2}{15} \times \frac{2}{15} - \frac{17}{15} \times \frac{4}{15}$ is simplified to

- (a) 0 (b) 1 (c) 2 (d) 3

117. $\sqrt{\frac{0.25}{0.0009}} \times \sqrt{\frac{0.09}{0.36}}$ is equal to :

- (a) $\frac{5}{6}$ (b) $7\frac{1}{6}$ (c) $7\frac{1}{3}$ (d) $8\frac{1}{3}$

118. The square root of $\overline{0.4}$ is :

- (a) $\overline{0.8}$ (b) $\overline{0.6}$
(c) $\overline{0.7}$ (d) $\overline{0.9}$

119. The value of $\sqrt{32} - \sqrt{128} + \sqrt{50}$ correct to 3 places of decimal is:

- (a) 1.732 (b) 1.141
(c) 1.414 (d) 1.441

120. The square root of

$$(7 + 3\sqrt{5})(7 - 3\sqrt{5})$$

- (a) 4 (b) $\sqrt{5}$ (c) $3\sqrt{5}$ (d) 2

121. The value of

$$\sqrt{400} + \sqrt{0.0400} + \sqrt{0.000004}$$

- (a) 0.222 (b) 20.22
(c) 20.202 (d) 2.022

122. If $\sqrt{3} = 1.7321$, the value of

$$\sqrt{192} - \frac{1}{2}\sqrt{48} - \sqrt{75}, \text{ correct to 3}$$

place of decimal, is

- (a) 8.661 (b) 4.331
(c) 1.732 (d) -1.732

123. $\sqrt{\frac{48.4}{0.289}}$ is equal to

- (a) $129\frac{7}{17}$ (b) $1\frac{5}{17}$
(c) $12\frac{16}{17}$ (d) $12\frac{1}{17}$

124. The number, whose square is equal to the difference of the squares of 75.15 and 60.12, is

- (a) 46.09 (b) 48.09
(c) 45.09 (d) 47.09

125. The sum of the squares of two numbers is 386. If one of the number is 5, the other will be:

- (a) 18 (b) 19 (c) 15 (d) 20

126. The sum of the cubes of the numbers 22, -15 and -7 is equal to

- (a) 6930 (b) 9630
(c) 3 (d) 0

127. The sum of the digits of the smallest number which, when multiplied by 1800, gives a perfect cube, is

- (a) 2 (b) 3 (c) 6 (d) 8

YEAR : 2005

128. The value of $\frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{2}{3} \text{ of } 1\frac{1}{4}}$

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

129. $\left(4\frac{11}{15} + \frac{15}{71}\right)^2 - \left(4\frac{11}{15} - \frac{15}{71}\right)^2$ is equal to:

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

130. The value of

$$\frac{0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02}{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04}$$

- (a) 0.125 (b) 0.625
(c) 0.25 (d) 0.5

131. If x represents a number, then

the value of x in $5\frac{3}{x} \times 3\frac{1}{2} = 19$ is:

- (a) 7 (b) 4 (c) 6 (d) 2

132. $\left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)^2$ equal to:

- (a) $2\frac{1}{2}$ (b) $3\frac{1}{2}$ (c) $4\frac{1}{2}$ (d) $5\frac{1}{2}$

133. The value of $(0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02 - 1$

- (a) 1.98 (b) 1.09
(c) 1 (d) 0

134. $(71 \times 29 + 27 \times 15 + 8 \times 4)$ equals

- (a) 3450 (b) 3458
(c) 2496 (d) None of these

135. $(0.05 \times 5 - 0.005 \times 5)$ equals

- (a) 2.250 (b) 0.225
(c) 0.0225 (d) 0.275

136. The value of

$$\frac{\sqrt[3]{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04}}{\sqrt[3]{0.4 \times 0.4 \times 0.4 + 0.08 \times 0.08 \times 0.08}}$$

- (a) 0.5 (b) 0.25
(c) 0.75 (d) 0.125

137. The square root of

$$\frac{\left(3\frac{1}{4}\right)^4 - \left(4\frac{1}{3}\right)^4}{\left(3\frac{1}{4}\right)^2 - \left(4\frac{1}{3}\right)^2}$$

- (a) $7\frac{1}{12}$ (b) $5\frac{5}{12}$
(c) $1\frac{1}{12}$ (d) $1\frac{7}{12}$

138. The smallest number added to 680621 to make the sum a perfect square is:

- (a) 4 (b) 5 (c) 6 (d) 8

139. The smallest positive integer when multiplied by 392, the product is a perfect square, is

- (a) 6 (b) 5 (c) 3 (d) 2

140. Which smallest number must be added to 2203 so that we get a perfect square?

- (a) 1 (b) 3 (c) 6 (d) 8

141. The number, whose square is equal to the difference between the squares of 975 and 585, is:

- (a) 780 (b) 390 (c) 1560 (d) 130

142. If the sum and difference of two number are 20 and 8 respectively, then the difference of their squares is:

- (a) 12 (b) 28 (c) 80 (d) 160

143. The sum of the squares of two positive integers is 100 and the difference of their squares is 28. The sum of the numbers is:

- (a) 12 (b) 13 (c) 14 (d) 15

144. Which smallest number must be added to 710 so that the sum is a perfect cube?

- (a) 29 (b) 19 (c) 11 (d) 21

YEAR : 2006

145. $\frac{13}{48}$ is equal to

(a) $\frac{1}{3 + \frac{1}{1 + \frac{1}{16}}}$ (b) $\frac{1}{2 + \frac{1}{1 + \frac{1}{8}}}$

(c) $\frac{1}{3 + \frac{1}{1 + \frac{1}{1 + \frac{1}{8}}}}$ (d) $\frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{4}}}}$

146. The value of $1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{2}{3}}}}$

- (a) $\frac{21}{13}$ (b) $\frac{17}{2}$ (c) $\frac{34}{21}$ (d) $\frac{8}{5}$

147. $\frac{(3.63)^2 - (2.37)^2}{3.63 + 2.37}$ is equal to

- (a) 6 (b) 1.36 (c) 2.26 (d) 1.26

148. The number of perfect square numbers between 50 and 1000 is

- (a) 21 (b) 22 (c) 23 (d) 24

149. If the product of four consecutive natural numbers increased by a natural number p is a perfect square; then the value of p is

- (a) 8 (b) 4 (c) 2 (d) 1

YEAR : 2007

150. $(256)^{0.16} \times (16)^{0.18}$ is equal to

- (a) 4 (b) 16
(c) 64 (d) 256.25

151. $\left(\frac{1}{3.5} + \frac{1}{5.7} + \frac{1}{7.9} + \frac{1}{9.11} + \frac{1}{11.13} + \frac{1}{13.15}\right)$ is equal to

- (a) $\frac{2}{45}$ (b) $\frac{2}{25}$ (c) $\frac{7}{45}$ (d) $\frac{2}{15}$

152. $(53 \times 87 + 159 \times 21 + 106 \times 25)$ is equal to

- (a) 16000 (b) 1060
(c) 10600 (d) 60100

153. The number of digits in the square root of 625686734489 is

- (a) 4 (b) 5 (c) 6 (d) 7

154. The smallest number which should be added to the number 8958 so that the result is a perfect square is

- (a) 69 (b) 67 (c) 77 (d) 79

155. Given that $\sqrt{24}$ is approximately

equal to 4.898. $\sqrt{\frac{8}{3}}$ is nearly

equal to

- (a) 0.544 (b) 1.333
(c) 1.633 (d) 2.666

156. There are some boys and girls in a room. The square of the number of the girls is less than the square of the number of boys by 28. If there were two more girls, the number of boys would have been the same as that of the girls. The total number of the boys and girls in the room are

- (a) 56 (b) 14 (c) 10 (d) 7

157. If the sum of the squares of three consecutive natural numbers is 110, then the smallest of these natural numbers is:

- (a) 8 (b) 6 (c) 7 (d) 5

158. The product of two whole numbers is 37. The square root of the difference of the numbers is
(a) 8 (b) 7.5 (c) 6 (d) 4.5

159. $\sqrt[3]{(333)^3 + (333)^3 + (334)^3 - 3 \times 333 \times 333 \times 334}$ is equal to
(a) 12 (b) 11 (c) 10 (d) 15

160. The sum of the squares of 2 number is 146 and the square root of one of them is 5. The cube of the other number is
(a) 1111 (b) 1221
(c) 1331 (d) 1441

161. The least number, by which 1944 must be multiplied so as to make the result a perfect cube is
(a) 2 (b) 3 (c) 6 (d) 13

162. The smallest natural number, by which 3000 must be divided to make the quotient a perfect cube, is:
(a) 3 (b) 4 (c) 5 (d) 6

163. The smallest positive integer n for which $864 \times n$ is a perfect cube, is:
(a) 1 (b) 2 (c) 3 (d) 4

YEAR : 2008

164. The value of $\frac{0.125 + 0.027}{0.25 - 0.15 + 0.09}$
(a) 0.2 (b) 0.25 (c) 0.3 (d) 0.8

165. $\frac{(7.5)^3 + 1}{(7.5)^2 - 6.5}$ is equal to
(a) 2.75 (b) $\frac{9}{5}$
(c) 4.75 (d) 8.5

166. The value of $\frac{(2.697 - 0.498)^2 + (2.697 + 0.498)^2}{2.697 \times 2.697 + 0.498 \times 0.498}$
(a) 4 (b) 2
(c) 2.199 (d) 3.195

167. $\sqrt{\frac{0.081 \times 0.484}{0.0064 \times 6.25}}$ is equal to
(a) 9 (b) .9 (c) 99 (d) .99

168. Given that $\sqrt{13} = 3.6$ and $\sqrt{130} = 11.4$, then the value of $\sqrt{13} + \sqrt{1300} + \sqrt{0.013}$ is equal to
(a) 36.164 (b) 637.254
(c) 39.714 (d) 37.154

169. The largest number of five digits, which is a perfect square is
(a) 99999 (b) 99976
(c) 99856 (d) 99764

170. The number, whose square is equal to the difference of the squares of the numbers 68 and 32, is
(a) 36 (b) 48 (c) 60 (d) 64

YEAR : 2009

171. The least fraction to be subtracted from the expression

$$3\frac{1}{4} - \frac{4}{5} \text{ of } \frac{5}{6}$$

$$4\frac{1}{3} \div \frac{1}{5} - \left(\frac{3}{10} + 21\frac{1}{5} \right) \text{ to make it an}$$

integer.

- (a) $\frac{1}{2}$ (b) $\frac{5}{6}$ (c) $\frac{1}{4}$ (d) $\frac{3}{10}$

172. If $\sqrt[2]{0.014 \times 0.14x} = 0.014 \times 0.14\sqrt[2]{y}$. find the value of $\frac{x}{y}$,
(a) 0.000196 (b) 0.00196
(c) 0.0196 (d) 0.196

173. The simplified value of $\sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + \sqrt{49}}}}}$
(a) 3 (b) 2 (c) 4 (d) 6

174. The smallest number that must be subtracted from 1000 to make the resulting number a perfect square is
(a) 37 (b) 38 (c) 39 (d) 40

YEAR : 2010

175. $\frac{4.41 \times 0.16}{2.1 \times 1.6 \times 0.21}$ is simplified to
(a) 1 (b) 0.1 (c) 0.01 (d) 10

176. $(0.1 \times 0.01 \times 0.01 \times 10^7)$ is equal to
(a) 100 (b) $\frac{1}{10}$ (c) $\frac{1}{100}$ (d) 10

177. $\frac{3.25 \times 3.20 - 3.20 \times 3.05}{0.064}$ is equal to:
(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{10}$ (d) 10

178. $\left\{ \frac{(0.1)^2 - (0.01)^2}{0.0001} \right\} + 1$ is equal to

- (a) 1010 (b) 110
(c) 101 (d) 100

179. $(0.5 \times 5 + 0.25 \times 0.5 + 0.5 \times 4 + 0.5 \times 0.75)$ is equal to
(a) 5 (b) 10 (c) 15 (d) 20

180. $\frac{(5+5+5+5) \div 5}{3+3+3+3 \div 3}$ is equal to

- (a) 1 (b) $\frac{3}{10}$ (c) $\frac{4}{9}$ (d) $\frac{2}{5}$

181. $\frac{(100-1)(100-2)(100-3)\dots(100-200)}{100 \times 99 \times 98 \times \dots \times 3 \times 2 \times 1}$ is equal to

- (a) $\frac{100}{99 \times 98 \times 97 \times \dots \times 3 \times 2 \times 1}$
(b) $-\frac{1}{99 \times 98 \times 97 \times \dots \times 3 \times 2 \times 1}$
(c) 0
(d) $-\frac{2}{99 \times 98 \times 97 \times \dots \times 3 \times 2 \times 1}$

182. $(0.9 \times 0.9 \times 0.9 + 0.1 \times 0.1 \times 0.1)$ is equal to
(a) 0.73 (b) 0.82
(c) 0.91 (d) 1.00

183. $\sqrt{\frac{0.009 \times 0.036 \times 0.016 \times 0.08}{0.002 \times 0.0008 \times 0.0002}}$ is equal to
(a) 34 (b) 36 (c) 38 (d) 39

184. $\sqrt{1\frac{1}{4} \times \frac{64}{125} \times 1.44}$ is equal to
(a) $1\frac{1}{25}$ (b) $\frac{24}{25}$

- (c) $\frac{23}{25}$ (d) $\frac{21}{25}$

185. $\left[2\sqrt{54} - 6\sqrt{\frac{2}{3}} - \sqrt{96} \right]$ is equal to
(a) 0 (b) 1 (c) 2 (d) $\sqrt{6}$

186. $\frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}}$ is equal to

- (a) $\frac{2}{\sqrt{6}}$ (b) $2\sqrt{6}$
(c) $4\sqrt{6}$ (d) 2

187. $\sqrt{110 + \frac{1}{4}}$ is equal to

- (a) 12.0 (b) 11.5
(c) 11.0 (d) 10.5

188. The smallest 4- digit number which is a perfect square is

- (a) 1009 (b) 1016
(c) 1024 (d) 1025

189. How many perfect squares lie between 120 and 300 ?

- (a) 5 (b) 6 (c) 7 (d) 8

190. If x is a perfect square integer such that $7 < (2x - 3) < 17$, then the value of x is :

- (a) 25 (b) 16 (c) 9 (d) 81

191. The sum of a positive integer and its square is 2450. The positive integer is:

- (a) 45 (b) 48 (c) 49 (d) 50

192. $\sqrt[3]{0.000064}$ is equal to

- (a) 0.0002 (b) 0.002
(c) 0.02 (d) 0.2

193. $\sqrt[3]{15612 + \sqrt{154} + \sqrt{225}}$ is equal to

- (a) 15 (b) 25 (c) 75 (d) 125

194. $\sqrt[3]{0.000125}$ is equal to

- (a) 0.5 (b) 0.15
(c) 0.05 (d) 0.005

195. $(\sqrt[3]{1000} + \sqrt[3]{0.008} - \sqrt[3]{0.125})$ is equal to

- (a) 9.7 (b) 9.97
(c) 9.997 (d) 9.9997

196. By what least number should 675 be multiplied so as to obtain a perfect cube number?

- (a) 3 (b) 5 (c) 24 (d) 40

197. The least number, that must be added to 1720 so as to obtain a perfect cube, is

- (a) 7 (b) 8 (c) 11 (d) 13

198. By what least number should 4320 be multiplied so as to obtain a number which is a perfect cube?

- (a) 40 (b) 50 (c) 60 (d) 80

YEAR : 2011

199. If $\frac{3a+4b}{3c+4d} = \frac{3a-4b}{3c-4d}$ then

- (a) $ab = cb$
(b) $ad = bc$
(c) $ac = bd$
(d) $a = b = c \neq d$

200. The value of $2\frac{1}{3} - 1\frac{2}{11}$
 $3 + \frac{1}{3 + \frac{1}{3}}$

- (a) $\frac{38}{109}$ (b) $\frac{109}{38}$
(c) 1 (d) $\frac{116}{109}$

201. The value of $3 + \frac{3}{3 + \frac{1}{3}}$

- (a) $\frac{40}{11}$ (b) $\frac{43}{11}$ (c) $\frac{46}{11}$ (d) $\frac{41}{11}$

202. $1 + \frac{1}{1 + \frac{1}{5}}$ = ?

- (a) $\frac{11}{6}$ (b) $\frac{13}{6}$
(c) $\frac{15}{6}$
(d) none of the above

203. The value of $\frac{(3.2)^3 - 0.008}{(3.2)^2 + 0.64 + 0.04}$

- (a) 0 (b) 2.994
(c) 3.208 (d) 3

204. Simplify:

$$\frac{\frac{1}{3} + \frac{1}{4} \left[\frac{2}{5} - \frac{1}{2} \right]}{1\frac{2}{3} \text{ of } \frac{3}{4} - \frac{3}{4} \text{ of } \frac{4}{5}}$$

- (a) $\frac{37}{78}$ (b) $\frac{37}{13}$ (c) $\frac{74}{78}$ (d) $\frac{74}{13}$

205. $\frac{0.04}{0.03}$ of $\left(3\frac{1}{3} - 2\frac{1}{2} \right) \div \frac{1}{2}$ of $1\frac{1}{4}$
 $\frac{1}{3} + \frac{1}{5}$ of $\frac{1}{9}$

- (a) 1 (b) 5 (c) $\frac{1}{5}$ (d) $\frac{1}{2}$

206. The sum of the squares of 3 consecutive positive numbers is 365. The sum of the numbers is

- (a) 30 (b) 33 (c) 36 (d) 45

207. $\sqrt{8 + \sqrt{57 + \sqrt{38 + \sqrt{108 + \sqrt{169}}}}} = ?$

- (a) 4 (b) 6 (c) 8 (d) 10

208. If the number p is 5 more than q and the sum of the squares of p and q is 55, then the product of p and q is

- (a) 10 (b) -10 (c) 15 (d) -15

209. The product of two numbers is 45 and their difference is 4. The sum of squares of the two numbers is

- (a) 135 (b) 240 (c) 73 (d) 106

210. $\sqrt[3]{1 - \frac{127}{343}}$ is equal to

- (a) $\frac{5}{9}$ (b) $1 - \frac{1}{7}$
(c) $\frac{4}{7}$ (d) $1 - \frac{2}{7}$

YEAR 2012

211. $\frac{0.3555 \times 0.5555 \times 2.025}{0.225 \times 1.7775 \times 0.2222}$ is equal to:

- (a) 5.4 (b) 4.58 (c) 4.5 (d) 5.45

(SSC CHSL DEO & LDC Exam 4.11.2012)

212. $100 \times 10 - 100 + 2000 \div 100 = ?$

- (a) 29 (b) 920
(c) 280 (d) 1000

(SSC CGL Tier I Exam 11.11.2012)

213. If $\frac{547.527}{0.0082} = x$, then the value

of $\frac{547527}{82}$ is

- (a) $10x$ (b) $100x$
(c) $\frac{x}{100}$ (d) $\frac{x}{10}$

(SSC CHSL DEO & LDC Exam 4.11.2012)

214. The value of

$$\sqrt{\frac{0.324 \times 0.081 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$$

- (a) 24 (b) 2.4
(c) 0.024 (d) 1.2

(SSC Constable (GD) & Rifleman (GD) Exam 22.04.2012)

215. The simplified value of $\sqrt{0.25 \times 225}$ is

- (a) 0.075 (b) 0.705
(c) 0.750 (d) 7.500

(SSC CHSL DEO & LDC Exam 4.11.2012)

216. If $\sqrt{18225} = 135$, then the value of $\sqrt{18225} + \sqrt{182.25} + \sqrt{1.8225} + \sqrt{0.018225}$ is

- (a) 14.9985 (b) 149.985
(c) 1499.85 (d) 1.49985

(SSC CHSL DEO & LDC Exam 21.10.2012)

217. The square root of $21\frac{51}{169}$ is

- (a) $5\frac{8}{13}$ (b) $4\frac{8}{13}$
(c) $4\frac{3}{13}$ (d) $5\frac{5}{13}$

(SSC CHSL DEO & LDC Exam 28.10.2012)

218. If $(1101)^2 = 1212201$. find the value of $\sqrt{121.2201}$

- (a) 110.1 (b) 11.01
(c) 1.101 (d) 11.001

(SSC CGL Tier I Exam 11.11.2012)

219. The value of

$$\sqrt{\frac{0.064 \times 0.256 \times 15.625}{0.025 \times 0.625 \times 4.096}}$$

- (a) 2 (b) 2.4 (c) 0.24 (d) 4.2

(SSC DP (SI) Exam 19.08.2012)

220. The number of pairs of natural numbers the difference of whose squares is 45 will be

- (a) 2 (b) 3 (c) 6 (d) 5

(SSC CHSL DEO & LDC Exam 04.11.2012)

221. If $\sqrt[3]{3^n} = 27$, then the value of n is:

- (a) 9 (b) 6 (c) 1 (d) 3

(SSC CHSL DEO & LDC Exam 4.11.2012)

YEAR : 2013

222. $\frac{4\frac{2}{7} - \frac{1}{2}}{3\frac{1}{2} + 1\frac{1}{7}} \div \frac{1}{2 + \frac{1}{2 + \frac{1}{5 - \frac{1}{5}}}}$ is equal to

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

(SSC CHSL DEO & LDC Exam 27.10.2013)

223. If $\left[4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}\right]^{th}$ part of a

journey takes ten minutes, then to complete $\frac{3}{5}^{th}$ of that journey. it will take
(a) 40 minutes (b) 45 minutes
(c) 48 minutes (d) 36 minutes

(SSC CHSL DEO & LDC Exam 10.11.2013)

224. $\frac{4\frac{1}{7} - 2\frac{1}{4}}{3\frac{1}{2} + 1\frac{1}{7}} \div \frac{1}{2 + \frac{1}{2 + \frac{1}{5 - \frac{1}{5}}}}$ is equal to

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

(SSC CHSL DEO & LDC Exam 10.11.2013)

225. The value of $1 + \frac{1}{1 + \frac{2}{3 + \frac{4}{5}}}$

- (a) $\frac{12}{29}$ (b) $\frac{8}{19}$ (c) $\frac{48}{29}$ (d) $\frac{2}{19}$

(SSC CAPF SI, ASI. Exam 23.06.2013)

226. $\frac{1}{1 + 2^{a-b}} + \frac{1}{1 + 2^{b-a}}$ is equal to

- (a) $\frac{1}{1 + 2^{a-b}} + \frac{1}{1 + 2^{b-a}}$
(a) $a - b$ (b) $b - a$
(c) 1 (d) 0

(SSC CGL Tier I Exam 21.04.2013)

227. The value of

$$3\frac{1}{2} - \left[2\frac{1}{4} \div \left\{1\frac{1}{4} - \frac{1}{2} \left(1\frac{1}{2} - \frac{1}{3} - \frac{1}{6}\right)\right\}\right]$$

- (a) $\frac{1}{2}$ (b) $2\frac{1}{2}$ (c) $3\frac{1}{2}$ (d) $9\frac{1}{2}$

(SSC CHSL DEO & LDC Exam 27.10.2013)

228. $3\frac{3}{5} \times 3\frac{3}{5} + 2 \times 3\frac{3}{5} \times \frac{2}{5} + \frac{2}{5} \times \frac{2}{5} = ?$

- (a) 15 (b) 16 (c) 17 (d) 18

(SSC Constable (GD) Exam 12.05.2013)

229. Find the sum of

$$\left(1 - \frac{1}{n+1}\right) + \left(1 - \frac{2}{n+1}\right) + \left(1 - \frac{3}{n+1}\right) + \dots + \left(1 - \frac{n}{n+1}\right)$$

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

- (c) $(n+1)$ (d) $\frac{1}{2}(n+1)$

(SSC CGL Tier II Exam 29.09.2013)

230. The value of

$$5\frac{1}{3} \div 1\frac{2}{9} \times \frac{1}{4} \left(10 + \frac{3}{1 - \frac{1}{5}}\right)$$

- (a) 15 (b) $\frac{67}{25}$ (c) $\frac{128}{11}$ (d) $\frac{128}{99}$

(SSC CGL Tier I Re-Exam (2013) 20.07.2014)

231. The value of

$$(3 + \sqrt{8}) + \frac{1}{3 - \sqrt{8}} - (6 + 4\sqrt{2})$$

- (a) 8 (b) 1 (c) $\sqrt{2}$ (d) 0

(SSC FCI Assistant Grade III Exam 07.04.2013)

232. What is the value of

$$\frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}} = ?$$

- (a) $2\sqrt{6}$ (b) $4\sqrt{6}$
(c) 2 (d) 4

(SSC MTS Exam 10.03.2013)

233. Simplify:

$$\sqrt{3 + \frac{33}{64}} \div \sqrt{9 + \frac{1}{7}} \times 2\sqrt{3\frac{1}{9}}$$

- (a) $\frac{45}{256}$ (b) $1\frac{17}{28}$
(c) $4\frac{3}{8}$ (d) $2\frac{3}{16}$

(SSC MTS Exam 17.03.2013)

234. The simplified value of $\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}}$ is

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

(SSC MTS Exam 17.03.2013)

235. Number of digits in the square root of 62478078 is:

- (a) 4 (b) 5
(c) 6 (d) 3

(SSC CGL Tier I Exam 21.04.2013)

236. If $\left(n^r - tn + \frac{1}{4}\right)$ be a perfect square, then the values of t are:

- (a) ± 2 (b) 1, 2 (c) 2, 3 (d) ± 1

(SSC CGL Tier I Exam 21.04.2013)

237. The square root of $33 - 4\sqrt{35}$ is:

- (a) $\pm(2\sqrt{7} + \sqrt{5})$ (b) $\pm(\sqrt{7} + 2\sqrt{5})$
(c) $\pm(\sqrt{7} - 2\sqrt{5})$ (d) $\pm(2\sqrt{7} - \sqrt{5})$

(SSC CGL Tier I Exam 21.04.2013)

238. Find the value of $\sqrt{156.25} + \sqrt{0.0081} - \sqrt{0.0361}$

- (a) 13.4 (b) 15.4
(c) 12.4 (d) 17.4

(SSC Constable (GD) Exam 12.05.2013)

239. The fourth root of 24010000 is
(a) 7 (b) 49 (c) 490 (d) 70

(SSC CGL Tier I Exam 19.05.2013)

240. The greatest 4 digit number which is a perfect square, is
(a) 9999 (b) 9909
(c) 9801 (d) 9081

(SSC CGL Tier I Exam 19.10.2013)

241. What number must be added to the expression $16a^2 - 12a$ to make it a perfect square?

- (a) $\frac{9}{4}$ (b) $\frac{11}{2}$ (c) $\frac{13}{2}$ (d) 16

(SSC CGL Tier I Exam 19.05.2013)

242. The value of $(\sqrt{4^3 + 15^2})^3$

- (a) 4913 (b) 4313
(c) 4193 (d) 3943

(SSC MTS Exam 10.03.2013)

243. $\sqrt[3]{4\frac{12}{125}}$ is equal to

- (a) 1.4 (b) 1.6 (c) 1.8 (d) 2.4

(SSC MTS Exam 17.03.2013)

YEAR : 2014

244. If $x[-2\{-4(-a)\} + 5[-2\{-2(-a)\}]] = 4a$, then $x = ?$

- (a) -2 (b) -3 (c) -4 (d) -5

(SSC CGL Tier I Exam 19.10.2014)

245. The least number which must be added to 1728 to make it a perfect square is?

- (a) 36 (b) 32 (c) 38 (d) 30

(SSC CHSL DEO & LDC Exam 16.04.2014)

246. If $a = 64$ and $b = 289$, then the

value of $(\sqrt{\sqrt{a} + \sqrt{b}} - \sqrt{\sqrt{b} - \sqrt{a}})^2$ is

$$(\sqrt{\sqrt{a} + \sqrt{b}} - \sqrt{\sqrt{b} - \sqrt{a}})^2$$

- (a) $2^{1/2}$ (b) 2 (c) 4 (d) -2

(SSC CHSL DEO & LDC Exam 16.04.2014)

247. $\sqrt{64009}$ is equal to

- (a) 352 (b) 523 (c) 253 (d) 532

(SSC CHSL DEO & LDC Exam 16.04.2014)

248. A tourist spends daily as many rupees as the number of days of his total tour. If his total expenses were ₹ 361, then how many days did his tour last?

- (a) 17 days (b) 19 days
(c) 21 days (d) 31 days

(SSC CGL Tier II Exam 21.09.2014)

249. The value of $\sqrt{10^{-6} \times 0.25}$ is

- (a) 0.0025 (b) 0.0005
(c) 0.25 (d) 0.50

(SSC CAPF SI, CISF DELHI POLICE Exam 22.06.2014)

250. The simplified value of

$$\frac{3\sqrt{2}}{\sqrt{3} + \sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6} + \sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3} + \sqrt{2}}$$

- (a) $\sqrt{2}$ (b) $\frac{1}{\sqrt{2}}$
(c) $\sqrt{3} - \sqrt{2}$ (d) 0

(SSC CHSL DEO & LDC Exam 02.11.2014)

251. The value of $\frac{4 - \sqrt{0.04}}{4 + \sqrt{0.36}}$ is close to

- (a) 0.4 (b) 0.8 (c) 1.0 (d) 1.4

(SSC CHSL DEO & LDC Exam 02.11.2014)

252. If $\sqrt{0.05 \times 0.5 \times a} = 0.5 \times 0.05 \times$

$\sqrt{b}$, then $\frac{a}{b}$ is equal to

- (a) 0.0025 (b) 0.025
(c) 0.25 (d) 0.00025

(SSC CHSL DEO & LDC Exam 02.11.2014)

253. A teacher wants to arrange his students in an equal number of rows and columns. If there are 1369 students, the number of students in the last row are

- (a) 37 (b) 33 (c) 63 (d) 47

(SSC CHSL DEO & LDC Exam 09.11.2014)

254. Which of the following is true?

- (a) $\sqrt{5} + \sqrt{3} > \sqrt{6} + \sqrt{2}$
(b) $\sqrt{5} + \sqrt{3} < \sqrt{6} + \sqrt{2}$
(c) $\sqrt{5} + \sqrt{3} = \sqrt{6} + \sqrt{2}$
(d) $(\sqrt{5} + \sqrt{3}) = (\sqrt{6} + \sqrt{2}) = 1$

(SSC CHSL DEO & LDC Exam 09.11.2014)

255. The least number by which 20184 must be multiplied so as to make the product a perfect square is

- (a) 2 (b) 3 (c) 5 (d) 6

(SSC CHSL DEO & LDC Exam 16.11.2014)

256. If $x = \sqrt{3} + \sqrt{2}$ then the value of

$$x^3 - \frac{1}{x^3}$$
 is

- (a) $10\sqrt{2}$ (b) $14\sqrt{2}$
(c) $22\sqrt{2}$ (d) $8\sqrt{2}$

(SSC CGL Tier I Re-Exam 27.04.2014)

257. The value of $(1001)^3$ is

- (a) 1003003001 (b) 100303001
(c) 100300301 (d) 103003001

(SSC CGL Tier I Exam 26.10.2014)

258. What is the smallest number by which 625 must be divided so that the quotient is a perfect cube?

- (a) 25 (b) 5
(c) 2 (d) 3

(SSC CGL Tier II Exam 21.09.2014)

259. The value of

$$(\sqrt{6} + \sqrt{10} - \sqrt{21} - \sqrt{35}) \times$$

$$(\sqrt{6} - \sqrt{10} + \sqrt{21} - \sqrt{35})$$

- (a) 27 (b) 18
(c) 40 (d) 10

(SSC CPO Exam 20.3.2016, Morning)

$$260. \frac{1}{a + \frac{1}{b + \frac{1}{c + \frac{1}{2}}}} = \frac{16}{23}, \text{ then the value of } a + b + c \text{ is}$$

- (a) 3 (b) 6 (c) 9 (d) 12

(SSC CPO Exam 20.3.2016, Morning)

261. The sum of two numbers is $15\frac{1}{3}$

and their difference is $4\frac{2}{3}$. The product of the numbers is

- (a) $48\frac{2}{3}$ (b) 60
(c) 50 (d) $53\frac{1}{3}$

(SSC CPO Exam 20.3.2016, Morning)

262. The value of

$$\frac{(0.013)^3 + 0.000000343}{(0.013)^2 - 0.000091 + 0.000049}$$
 is

- (a) 0.03 (b) 0.01
(c) 0.04 (d) 0.02

263. Let a be a positive integer. When 89 and 125 are divided by a, the remainders are 4 and 6 respectively. Then the value of a is

- (a) 15 (b) 17 (c) 9 (d) 7

(SSC CPO Exam 20.3.2016, Morning)

264. The value of following is:

$$\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$$

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

(SSC CPO Exam 20.3.2016, Evening)

265. If $x = \sqrt[3]{7} + 3$ then the value of $x^3 - 9x^2 + 27x - 34$ is:

- (a) 2 (b) 1 (c) -1 (d) 0.

(SSC CPO Exam 20.3.2016, Evening)

266. The value of x in the below equation is:

$$0.\overline{3} + 0.\overline{6} + 0.\overline{7} + 0.\overline{8} = x$$

- (a) 5.3 (b) $2.\overline{35}$
(c) $2\frac{2}{3}$ (d) $2\frac{3}{10}$

(SSC CPO Exam 20.3.2016, Evening)

267. Simplified value of the following expression is:

$$\frac{1}{\sqrt{11-2\sqrt{30}}} - \frac{3}{\sqrt{7-2\sqrt{10}}} - \frac{4}{\sqrt{8-4\sqrt{3}}}$$

- (a) 0 (b) 1
(c) $\sqrt{2}$ (d) $\sqrt{3}$

(SSC CPO Exam 20.3.2016, Evening)

268. Given $2^2 + 4^2 + 6^2 + \dots + 40^2 = 11480$, then the value of $1^2 + 2^2 + 3^2 + \dots + 20^2$ is :

- (a) 2868 (b) 2870
(c) 2869 (d) 2867

(SSC CPO Exam 20.3.2016, Evening)

269. The value of following is:

$$\frac{0.2 \times 0.02 \times 0.002 \times 32}{0.4 \times 0.04 \times 0.004 \times 16}$$

- (a) 0.40 (b) 0.50
(c) 0.20 (d) 0.25

(SSC CPO Exam 20.3.2016, Evening)

270. The sum of 3 consecutive natural numbers divisible by 3 is 45. The smallest number is:

- (a) 12 (b) 3
(c) 18 (d) 9

(SSC CPO Exam 20.3.2016, Evening)

271. If $1^2 + 2^2 + 3^2 + \dots + p^2 =$

$$\frac{p(p+1)(2p+1)}{6}, \text{ then } 1^2 + 3^2 +$$

$5^2 + \dots + 17^2$ is

- (a) 969 (b) 1785
(c) 980 (d) 1700

(SSC CPO Exam 20.3.2016, Evening)

272. The simplest value of

$$\left(\frac{1}{\sqrt{9}-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} \right)$$

- (a) $3 - \sqrt{5}$ (b) 3
(c) $\sqrt{5}$ (d) $\sqrt{5} - 3$

(SSC CPO(Re) 04-06-2016, Morning)

273. Find value of $[2 \times 3^{n+4} - 9 \times 3^n] / 3^{n+2}$.

- (a) 18 (b) 3 (c) 1 (d) 17

(SSC CPO(Re) 05-06-2016, Morning)

274. What will be the remainder when $252^{126} + 244^{152}$ is divided by 10?

- (a) 8 (b) 6 (c) 0 (d) 8

(SSC CPO(Re) 07-06-2016, Evening)

275. If $\sqrt{3} = 1.732$ then find the

$$\text{value of } \frac{9+2\sqrt{3}}{\sqrt{3}}$$

- (a) 7.169 (b) 7.196
(c) 5.198 (d) 7.296

(SSC CGL Pre Exam 2016)

276. The value of $\frac{(2.3)^3 + 0.027}{(2.3)^2 - 0.6 + 0.09}$

- (a) 2 (b) 2.27
(c) 2.33 (d) 2.6

(SSC CGL Pre Exam 2016)

277. $6\frac{1}{4}\%$ of 1600 + $12\frac{1}{2}\%$ of 800

equals

- (a) 100 (b) 150
(c) 200 (d) 250

(SSC CGL Pre Exam 2016)

278. In a school, 391 boys and 323 girls have been divided into the largest possible equal classes, so that each class of boys numbers the same as each class of girls. What is the number of classes?

- (a) 23 (b) 19 (c) 44 (d) 17

(SSC CGL Pre Exam 2016)

279. There are 1400 students in a school, 25% of those wear spectacles and $\frac{2}{7}$ of those wearing spectacles are boys. How many girls in the school wear spectacles?

- (a) 250 (b) 100
(c) 200 (d) 300

(SSC CGL Pre Exam 2016)

280. If $9x^2 + 16y^2 = 60$ and $3x + 4y = 6$ then the value of xy is

- (a) -1 (b) 1 (c) -2 (d) 2

(SSC CGL Pre Exam 2016)

281. On simplification the value of

$$1 - \frac{1}{1+\sqrt{2}} + \frac{1}{1-\sqrt{2}}$$
 is

- (a) $2\sqrt{2} - 1$ (b) $1 - 2\sqrt{2}$
(c) $1 - \sqrt{2}$ (d) $-2\sqrt{2}$

(SSC CGL Pre Exam 2016)

282. Let $0 < x < 1$. Then the correct inequality is

- (a) $x < \sqrt{x} < x^2$
(b) $\sqrt{x} < x < x^2$
(c) $x^2 < x < \sqrt{x}$
(d) $\sqrt{x} < x^2 < x$

283 If the sum of the digits of a three digit number is subtracted from that number then it will always be divisible by

- (a) 3 only (b) 9 only
(c) both 3 and 9 (d) all of 3, 6 and 9

(SSC CGL Mains Exam 2016)

284. Which of the following is correct?

- (a) $\frac{2}{3} < \frac{3}{5} < \frac{11}{15}$
(b) $\frac{3}{5} < \frac{2}{3} < \frac{11}{15}$
(c) $\frac{11}{15} < \frac{3}{5} < \frac{2}{3}$
(d) $\frac{3}{5} < \frac{11}{15} < \frac{2}{3}$

(SSC CGL Mains Exam 2016)

285. The greater of the two numbers whose product is 900 and sum exceeds their difference by 30 is

- (a) 60 (b) 75
(c) 90 (d) 100

(SSC CGL Mains Exam 2016)

286. The smallest fraction which should be added to the sum of

$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, and $5\frac{1}{5}$, to make the result a whole number is

- (a) $\frac{13}{60}$ (b) $\frac{1}{4}$
(c) $\frac{17}{60}$ (d) $\frac{43}{60}$

(SSC CGL Mains Exam 2016)

287 Find the cube root of (-13824)
OR

Find the value of $\sqrt[3]{-13824}$

- (a) 38 (b) 24
(c) -38 (d) -24

(SSC CGL Mains Exam 2016)

288. The sum of three positive numbers is 18 and their product is 162. If the sum of two numbers is equal to the third then the sum of squares of the numbers is

- (a) 120 (b) 132
(c) 126 (d) 138

(SSC CGL Mains Exam 2016)

289. In a division sum, the divisor 'd' is 10 times the quotient 'q' and 5 times the remainder 'r'. If $r = 46$, the dividend will be

- (a) 5042 (b) 4247
(c) 5328 (d) 5336

(SSC CGL Mains Exam 2016)

290. Nattu and Buckhu each have certain number of oranges. Nattu says to Buckhu, "If you give me 10 of your oranges, I will have twice the number of oranges left with you". Buckhu replies, "If you give me 10 of your oranges, I will have twice the number of oranges left with

you". Buckhu replies, "If you give me 10 of your oranges, I will have the same number of oranges as left with you." What is the number of oranges with Nattu and Buckhu, respectively?

- (a) 50, 20 (b) 70, 50
(c) 20, 50 (d) 50, 70

(SSC CGL Mains Exam 2016)

291. Two baskets together have 640

oranges. If $\left(\frac{1}{5}\right)^{\text{th}}$ of the oranges in the first basket be taken to the second basket. Then oranges become equal in both basket. The number of oranges in the first basket is

(SSC CGL Mains Exam 2016)

- (a) 800 (b) 600
(c) 400 (d) 300

292. Simplify:

$$\sqrt[3]{-2197} \times \sqrt[3]{-125} \div \sqrt[3]{\frac{27}{512}}$$

- (a) $\frac{492}{7}$
(b) $\frac{520}{3}$
(c) $\frac{554}{7}$
(d) $\frac{571}{5}$

(SSC CGL Mains Exam 2016)



ANSWER KEY

1. (a)	30. (d)	59. (c)	88. (a)	117. (d)	146. (c)	175. (a)	204. (a)	233. (d)	262. (d)
2. (a)	31. (d)	60. (b)	89. (c)	118. (b)	147. (d)	176. (a)	205. (b)	234. (b)	263. (b)
3. (c)	32. (b)	61. (d)	90. (a)	119. (c)	148. (d)	177. (d)	206. (b)	235. (a)	264. (c)
4. (a)	33. (d)	62. (c)	91. (d)	120. (d)	149. (d)	178. (d)	207. (a)	236. (d)	265. (d)
5. (c)	34. (d)	63. (c)	92. (b)	121. (c)	150. (a)	179. (a)	208. (c)	237. (d)	266. (c)
6. (c)	35. (d)	64. (a)	93. (a)	122. (c)	151. (d)	180. (d)	209. (d)	238. (c)	267. (a)
7. (a)	36. (d)	65. (d)	94. (d)	123. (c)	152. (c)	181. (c)	210. (b)	239. (d)	268. (b)
8. (c)	37. (c)	66. (c)	95. (b)	124. (c)	153. (c)	182. (a)	211. (c)	240. (c)	269. (d)
9. (c)	38. (d)	67. (c)	96. (b)	125. (b)	154. (b)	183. (b)	212. (b)	241. (a)	270. (a)
10. (a)	39. (a)	68. (b)	97. (a)	126. (a)	155. (c)	184. (b)	213. (d)	242. (a)	271. (a)
11. (d)	40. (d)	69. (d)	98. (b)	127. (c)	156. (b)	185. (a)	214. (c)	243. (b)	272. (a)
12. (a)	41. (c)	70. (b)	99. (d)	128. (a)	157. (d)	186. (d)	215. (c)	244. (b)	273. (d)
13. (a)	42. (a)	71. (c)	100. (b)	129. (d)	158. (c)	187. (d)	216. (b)	245. (a)	274. (c)
14. (b)	43. (a)	72. (c)	101. (c)	130. (a)	159. (c)	188. (c)	217. (b)	246. (a)	275. (b)
15. (d)	44. (c)	73. (c)	102. (a)	131. (a)	160. (c)	189. (c)	218. (b)	247. (c)	276. (d)
16. (c)	45. (d)	74. (b)	103. (b)	132. (c)	161. (b)	190. (c)	219. (a)	248. (b)	277. (c)
17. (b)	46. (b)	75. (b)	104. (d)	133. (d)	162. (a)	191. (c)	220. (b)	249. (b)	278. (d)
18. (c)	47. (a)	76. (d)	105. (b)	134. (c)	163. (b)	192. (d)	221. (a)	250. (d)	279. (a)
19. (d)	48. (a)	77. (b)	106. (b)	135. (b)	164. (d)	193. (b)	222. (c)	251. (b)	280. (a)
20. (b)	49. (d)	78. (b)	107. (a)	136. (a)	165. (d)	194. (c)	223. (c)	252. (b)	281. (b)
21. (d)	50. (c)	79. (a)	108. (d)	137. (b)	166. (b)	195. (a)	224. (a)	253. (a)	282. (c)
22. (b)	51. (b)	80. (d)	109. (d)	138. (a)	167. (d)	196. (b)	225. (c)	254. (a)	283. (c)
23. (a)	52. (b)	81. (d)	110. (c)	139. (d)	168. (c)	197. (b)	226. (c)	255. (d)	284. (b)
24. (a)	53. (b)	82. (a)	111. (b)	140. (c)	169. (c)	198. (b)	227. (a)	256. (c)	285. (a)
25. (d)	54. (c)	83. (b)	112. (d)	141. (a)	170. (c)	199. (b)	228. (b)	257. (a)	286. (d)
26. (c)	55. (c)	84. (c)	113. (b)	142. (d)	171. (a)	200. (a)	229. (b)	258. (b)	287. (d)
27. (c)	56. (b)	85. (c)	114. (b)	143. (c)	172. (b)	201. (b)	230. (a)	259. (d)	288. (c)
28. (b)	57. (c)	86. (b)	115. (d)	144. (b)	173. (a)	202. (a)	231. (d)	260. (b)	289. (d)
29. (a)	58. (a)	87. (b)	116. (b)	145. (d)	174. (c)	203. (d)	232. (c)	261. (d)	290. (b)

EXPLANATION

1. (a) According to the question,

$$\begin{aligned}
 & 1 + \frac{1}{1 + \frac{2}{2 + \frac{3}{1 + \frac{4}{5}}}} \\
 & \Rightarrow 1 + \frac{1}{1 + \frac{2}{2 + \frac{3}{\frac{5+4}{5}}}} \\
 & \Rightarrow 1 + \frac{1}{1 + \frac{2}{2 + \frac{3 \times 5}{9}}} \\
 & \Rightarrow 1 + \frac{1}{1 + \frac{2}{\frac{18+15}{9}}} \\
 & \Rightarrow 1 + \frac{1}{1 + \frac{18}{33}} \\
 & \Rightarrow 1 + \frac{1}{\frac{33+18}{33}} \\
 & \Rightarrow 1 + \frac{33}{51} \Rightarrow \frac{51+33}{51} \\
 & \Rightarrow \frac{84}{51} \Rightarrow 1\frac{11}{17} \\
 \end{aligned}$$

2. (a) According to the question,

$$\begin{aligned}
 & 1 + \frac{2}{1 + \frac{3}{1 + \frac{4}{1 + \frac{5}{5}}}} \\
 & \Rightarrow 1 + \frac{2}{1 + \frac{3 \times 5}{5+4}} \\
 & \Rightarrow 1 + \frac{2}{1 + \frac{15}{9}} \\
 & \Rightarrow 1 + \frac{18}{9+15} \\
 & \Rightarrow \frac{24+18}{24} \Rightarrow \frac{42}{24} \\
 & \Rightarrow \frac{7}{4}
 \end{aligned}$$

3. (c) According to the question,

$$\begin{aligned}
 & \frac{9|3-5| - 5|4| \div 10}{-3(5) - 2 \times 4 \div 2} \\
 & \Rightarrow \frac{9 \times 2 - 20 \div 10}{-15 - 2 \times 2} \\
 & \Rightarrow \frac{18 - 2}{-15 - 4} \\
 & \Rightarrow \frac{-16}{19}
 \end{aligned}$$

4. (a) According to the question,

$$\begin{aligned}
 & 5 - [4 - (3 - \{3 - 3 - 6\})] \\
 & \Rightarrow 5 - [4 - (3 - \{-6\})] \\
 & \Rightarrow 5 - [4 - (3 + 6)] \\
 & \Rightarrow 5 - [4 - 9] \\
 & \Rightarrow 5 - [-5] \\
 & \Rightarrow 5 + 5 = 10
 \end{aligned}$$

5. (c) According to the question,

$$\begin{aligned}
 & \frac{-(4-6)^2 - 3(-2) + |-6|}{18 - 9 \div 3 \times 5} \\
 & \Rightarrow \frac{-(-2)^2 + 6 + 6}{18 - 3 \times 5} \\
 & \Rightarrow \frac{-4 + 6 + 6}{18 - 15} \Rightarrow \frac{8}{3}
 \end{aligned}$$

6. (c) According to the question,

$$\begin{aligned}
 & \frac{\frac{5}{3} \times \frac{7}{51} \text{ of } \frac{17}{5} - \frac{1}{3}}{\frac{2}{9} \times \frac{5}{7} \text{ of } \frac{28}{5} - \frac{2}{3}} \\
 & \Rightarrow \frac{\frac{5}{3} \times \frac{7}{51} \times \frac{17}{5} - \frac{1}{3}}{\frac{2}{9} \times \frac{5}{7} \times \frac{28}{5} - \frac{2}{3}} \\
 & \Rightarrow \frac{\frac{5}{3} \times \frac{7}{15} - \frac{1}{3}}{\frac{2}{9} \times 4 - \frac{2}{3}} \\
 & \Rightarrow \frac{\frac{7}{9} - \frac{1}{3}}{\frac{8}{9} - \frac{2}{3}} \Rightarrow \frac{\frac{7-3}{9}}{\frac{8-6}{9}} \\
 & \Rightarrow \frac{4}{2} = 2
 \end{aligned}$$

7. (a) According to the question,

$$\begin{aligned}
 & 1 - [5 - \{2 + (-5 + 6 - 2)2\}] \\
 & \Rightarrow 1 - [5 - \{2 + (-1)2\}] \\
 & \Rightarrow 1 - [5 - \{2 - 2\}] \\
 & \Rightarrow 1 - [5 - 0] \\
 & \Rightarrow 1 - 5 = -4
 \end{aligned}$$

8. (c) According to the question,

$$\begin{aligned}
 & \sqrt{1.3} + \sqrt{1300} + \sqrt{0.013} \\
 & \Rightarrow \sqrt{\frac{130}{100}} + \sqrt{1300} + \sqrt{\frac{130}{10000}} \\
 & \Rightarrow \frac{11.4}{10} + 36.05 + \frac{11.4}{100} \\
 & \Rightarrow 1.14 + 36.05 + 0.114 \\
 & \Rightarrow 37.304
 \end{aligned}$$

9. (c) According to the question,

$$\begin{aligned}
 & \frac{(2.644)^2 - (2.356)^2}{0.288} \\
 & \Rightarrow \frac{(2.644 + 2.356)(2.644 - 2.356)}{0.288} \\
 & \quad [\because a^2 - b^2 = (a+b)(a-b)] \\
 & \Rightarrow \frac{5 \times 0.288}{0.288} = 5
 \end{aligned}$$

10. (a) According to the question,

$$\begin{aligned}
 & \frac{(3.4567)^2 - (3.4533)^2}{0.0034} \\
 & \quad [\because a^2 - b^2 = (a+b)(a-b)] \\
 & \Rightarrow \frac{(3.4567 + 3.4533)(3.4567 - 3.4533)}{0.0034} \\
 & \Rightarrow \frac{6.91 \times 0.0034}{0.0034} = 6.91
 \end{aligned}$$

11. (d) According to the question,

$$\begin{aligned}
 & \frac{(0.03)^2 - (0.01)^2}{0.03 - 0.01} \\
 & \Rightarrow \frac{(0.03 + 0.01)(0.03 - 0.01)}{(0.03 - 0.01)} \\
 & \quad [\because a^2 - b^2 = (a+b)(a-b)] \\
 & \Rightarrow (0.03 + 0.01) \\
 & \Rightarrow 0.04
 \end{aligned}$$

12. (a) According to the question,

$$\text{Square root of } 0.09 = \sqrt{0.09} = 0.3$$

13. (a) According to the question,

$$\begin{aligned} &\Rightarrow \frac{(0.75)^3}{1-0.75} + \left[0.75 + (0.75)^2 + 1 \right] \\ &\Rightarrow \frac{(0.75)^3}{1-0.75} + \frac{1^3 - (0.75)^3}{1-0.75} \\ &\quad \left[\because a^3 - b^3 = (a-b)(a^2 + b^2 + ab) \right] \\ &\Rightarrow \frac{(0.75)^3 + 1 - (0.75)^3}{0.25} \\ &\Rightarrow \frac{1}{0.25} \Rightarrow 4 \end{aligned}$$

14. (b) According to the question,

$$\begin{aligned} &\sqrt{\frac{0.49}{0.25}} + \sqrt{\frac{0.81}{0.36}} \\ &\Rightarrow \frac{7}{5} + \frac{9}{6} \Rightarrow \frac{42 + 45}{30} \\ &\Rightarrow \frac{87}{30} \Rightarrow 2\frac{9}{10} \end{aligned}$$

15. (d) According to the question,

$$\begin{aligned} &\sqrt{x} \div \sqrt{441} = 0.02 \\ &\Rightarrow \frac{\sqrt{x}}{\sqrt{441}} = 0.02 \\ &\Rightarrow \frac{\sqrt{x}}{21} = \frac{2}{100} \\ &\Rightarrow \sqrt{x} = \frac{42}{100} \\ &\text{Squaring both sides.} \\ &\Rightarrow x = 0.1764 \end{aligned}$$

16. (c) According to the question,

$$\begin{aligned} &\sqrt{4 + \sqrt{44 + \sqrt{10000}}} \\ &\Rightarrow \sqrt{4 + \sqrt{44 + 100}} \\ &\Rightarrow \sqrt{4 + \sqrt{144}} \\ &\Rightarrow \sqrt{4 + 12} \Rightarrow \sqrt{16} = 4 \end{aligned}$$

17. (b) According to the question,

$$\begin{aligned} &\text{Given: } \sqrt{841} = 29 \\ &\therefore \sqrt{0.00000841} = 0.0029 \end{aligned}$$

18. (c) According to the question,

$$\begin{aligned} &\sqrt{100} = 10 \\ &\Rightarrow \text{Since } 99 < 100 \text{ So, square root of } 99 \text{ or any no. less than } 100 \text{ will be less than } 10. \\ &\text{So, the range lies between } -10 \text{ to } 10 \text{ in given series.} \end{aligned}$$

19. (d) According to the question,

$$\begin{array}{r|l} 3 & 5808 \\ \hline 2 & 1936 \\ 2 & 968 \\ 2 & 484 \\ 2 & 242 \\ 11 & 121 \\ 11 & 11 \\ \hline & 1 \end{array}$$

Factors are:

$$\boxed{3} \overbrace{2, 2, 2, 2, 11, 11}$$

Smallest number is = 3

20. (b) According to the question,

$$\begin{aligned} &\frac{\sqrt[3]{8}}{\sqrt{16}} \div \sqrt{\frac{100}{49}} \times \sqrt[3]{125} \\ &\Rightarrow \frac{2}{4} \div \frac{10}{7} \times 5 \\ &\Rightarrow \frac{2}{4} \times \frac{7}{10} \times 5 \\ &\Rightarrow \frac{7}{4} = 1\frac{3}{4} \end{aligned}$$

21. (d) According to the question,

$$\begin{array}{r|l} 3 & 1323 \\ \hline 3 & 441 \\ 3 & 147 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$$

Factors are: $\overbrace{3, 3, 3, 7, 7, 7}$

$\therefore$ Smallest number is = 7

22. (b) According to the question,

$$\begin{aligned} &3034 - (1002 \div 20.04) \\ &\Rightarrow 3034 - \frac{1002}{20.04} \\ &\Rightarrow 3034 - \frac{1002}{2004} \times 100 \\ &\Rightarrow 3034 - \frac{1}{2} \times 100 \\ &\Rightarrow 3034 - 50 = 2984 \end{aligned}$$

23. (a) According to the question,

$$\begin{aligned} &(100)^{\frac{1}{2}} \times (0.001)^{\frac{1}{3}} - (0.0016)^{\frac{1}{4}} \times 3^0 + \left(\frac{5}{4}\right)^{-1} \\ &\Rightarrow 10 \times 0.1 - 0.2 \times 1 + \frac{4}{5} \\ &\Rightarrow 10 \times 0.1 - 0.2 + \frac{4}{5} \\ &\Rightarrow 1 - \frac{2}{10} + \frac{4}{5} \end{aligned}$$

$$\Rightarrow 1 - \frac{1}{5} + \frac{4}{5}$$

$$\Rightarrow \frac{5 - 1 + 4}{5}$$

$$\Rightarrow \frac{8}{5} = 1.6$$

24. (a) According to the question,

$$\begin{aligned} &\frac{1}{2} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} \\ &\Rightarrow \frac{2}{5} - \frac{5}{9} + \frac{3}{5} - \frac{7}{18} \\ &\quad \frac{30 - 15 + 12 - 10}{60} \\ &\Rightarrow \frac{60}{36 - 50 + 54 - 35} \\ &\quad 90 \\ &\Rightarrow \frac{17}{60} \times \frac{90}{5} = 5\frac{1}{10} \end{aligned}$$

25. (d) According to the question,

$$\begin{aligned} &\frac{\sqrt{72} - \sqrt{18}}{\sqrt{12}} \\ &\Rightarrow \frac{\sqrt{72}}{\sqrt{12}} - \frac{\sqrt{18}}{\sqrt{12}} \\ &\Rightarrow \sqrt{6} - \sqrt{\frac{6}{4}} \\ &\Rightarrow \sqrt{6} - \frac{\sqrt{6}}{2} \Rightarrow \frac{\sqrt{6}}{2} \end{aligned}$$

26. (c) According to the question,

$$\begin{aligned} &\frac{\sqrt{80} - \sqrt{112}}{\sqrt{45} - \sqrt{63}} \\ &\Rightarrow \frac{4\sqrt{5} - 4\sqrt{7}}{3\sqrt{5} - 3\sqrt{7}} \\ &\Rightarrow \frac{4(\sqrt{5} - \sqrt{7})}{3(\sqrt{5} - \sqrt{7})} = \frac{4}{3} \Rightarrow 1\frac{1}{3} \end{aligned}$$

27. (c) According to the question,

$$\begin{aligned} &\Rightarrow \sqrt{(272)^2 - (128)^2} \\ &\Rightarrow \sqrt{(272 + 128)(272 - 128)} \\ &\quad \left[\because a^2 - b^2 = (a+b)(a-b) \right] \end{aligned}$$

$$\Rightarrow \sqrt{400 \times 144}$$

$$\Rightarrow 20 \times 12 = 240$$

28. (b) According to the question,

$$\Rightarrow \sqrt{15,876} = 126$$

Hence, Unit digit is 6

29. (a) According to the question,

$$x + y = 22 \quad \dots(i)$$

$$x^2 + y^2 = 404 \quad \dots(ii)$$

$$\therefore (x + y)^2 = x^2 + y^2 + 2xy$$

$$(22)^2 = 404 + 2xy$$

$$484 = 404 + 2xy$$

$$2xy = 80$$

$$xy = 40$$

30. (d) According to the question,

$$\frac{1}{3}\sqrt{x} = 0.001$$

$$\sqrt{x} = 0.003$$

Squaring both sides

$$x = 0.000009$$

$$\therefore \text{Number is} = 0.000009$$

31. (d) According to the question,

$$\Rightarrow \frac{1008}{7} = 144 = (12)^2$$

$$\therefore \text{Number is} = 7$$

32. (b) According to the question,

$$\Rightarrow \sqrt[3]{\frac{72.9}{0.4096}}$$

$$\Rightarrow \sqrt[3]{\frac{729 \times 10000}{4096 \times 10}}$$

$$\Rightarrow \sqrt[3]{\frac{729}{4096} \times 1000}$$

$$\Rightarrow \frac{9}{16} \times 10 \Rightarrow 5.625$$

33. (d) According to the question,

$$\Rightarrow (5.5)^3 - (4.5)^3$$

$$[\because a^3 - b^3 = (a - b)(a^2 + b^2 + ab)]$$

$$\Rightarrow (5.5 - 4.5)[(5.5)^2 + (4.5)^2 + 5.5 \times 4.5]$$

$$\Rightarrow 1(30.25 + 20.25 + 24.75)$$

$$= 75.25$$

34. (d) Only 64 is a perfect square as well as a cube : $8^2 = 64$

$$4^3 = 64$$

35. (d) According to the question,

$$\Rightarrow x^3 - x^2 = 48 \quad \dots(i)$$

Now check from option to save your valuable time.

Option: (d) Number = 4

$$\Rightarrow (4)^3 - (4)^2$$

$$\Rightarrow 64 - 16$$

$$\Rightarrow 48 \text{ (satisfied)}$$

36. (d) According to the question,

$$\Rightarrow \frac{1}{3 + \frac{1}{2 - \frac{1}{\frac{7}{9}}}} + \frac{17}{22}$$

$$\Rightarrow \frac{1}{3 + \frac{1}{\frac{9}{2 - \frac{1}{7}}}} + \frac{17}{22}$$

$$\Rightarrow \frac{1}{3 + \frac{7}{5}} + \frac{17}{22}$$

$$\Rightarrow \frac{5}{15 + 7} + \frac{17}{22}$$

$$\Rightarrow \frac{5}{22} + \frac{17}{22} \Rightarrow \frac{22}{22} = 1$$

37. (c) According to the question,

$$\text{If } x = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{2}}}}$$

$$\Rightarrow x = 1 + \frac{1}{1 + \frac{1}{1 + \frac{2}{1 + \frac{1}{3}}}}$$

$$\Rightarrow x = 1 + \frac{1}{1 + \frac{3}{1 + \frac{5}{8}}} \Rightarrow x = \frac{13}{8}$$

$\therefore$ Value of $2x + \frac{7}{4}$ is

$$\Rightarrow 2 \times \frac{13}{8} + \frac{7}{4} \Rightarrow \frac{13}{4} + \frac{7}{4}$$

$$\Rightarrow \frac{20}{4} = 5$$

38. (d) According to the question,

$$\Rightarrow \frac{19}{43} + \frac{1}{2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{4}}}}$$

$$\Rightarrow \frac{19}{43} + \frac{1}{2 + \frac{1}{3 + \frac{4}{5}}}$$

$$\Rightarrow \frac{19}{43} + \frac{1}{2 + \frac{5}{19}}$$

$$\Rightarrow \frac{19}{43} + \frac{19}{43} \Rightarrow \frac{38}{43}$$

39. (a) According to the question,

$$\Rightarrow 8\frac{1}{2} - \left[3\frac{1}{4} + \left\{ 1\frac{1}{4} - \frac{1}{2} \left(1\frac{1}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

$$\Rightarrow \frac{17}{2} - \left[\frac{13}{4} + \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

$$\Rightarrow \frac{17}{2} - \left[\frac{13}{4} + \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{9 - 2 - 1}{6} \right) \right\} \right]$$

$$\Rightarrow \frac{17}{2} - \left[\frac{13}{4} + \left\{ \frac{5}{4} - \frac{1}{2} \times 1 \right\} \right]$$

$$\Rightarrow \frac{17}{2} - \left[\frac{13}{4} + \frac{5 - 2}{4} \right]$$

$$\Rightarrow \frac{17}{2} - \left[\frac{13}{4} + \frac{3}{4} \right]$$

$$\Rightarrow \frac{17}{2} - \frac{16}{4}$$

$$\Rightarrow \frac{34 - 16}{4} = \frac{18}{4}$$

$$\Rightarrow \frac{9}{2} = 4\frac{1}{2}$$

40. (d) According to the question.

$$\Rightarrow \frac{50}{x} = \frac{x}{12\frac{1}{2}}$$

$$\Rightarrow 50 \times \frac{25}{2} = x^2$$

$$\Rightarrow x^2 = 25 \times 25$$

$$\therefore x = 25$$

41. (c) According to the question

$$\Rightarrow \frac{0.008 \times 0.01 \times 0.072}{0.12 \times 0.004}$$

$$\Rightarrow \frac{8 \times 1 \times 72}{12 \times 4 \times 1000} \Rightarrow \frac{12}{1000} = 0.012$$

42. (a) According to the question

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{2}{3} \text{ of } 1\frac{1}{4}}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{2}{3} \text{ of } \frac{5}{4}}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{5}{6}} \Rightarrow \frac{2}{3} \times \frac{3}{1} = 2$$

43. (a) According to the Question.

$$\Rightarrow \frac{1}{9} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72}$$

$$\Rightarrow \frac{1}{9} + \frac{1}{2} + \frac{1}{3} + \frac{1}{3} + \frac{1}{4} + \frac{1}{4} + \frac{1}{5} + \frac{1}{5} + \frac{1}{6} + \frac{1}{6} + \frac{1}{7} + \frac{1}{7}$$

$$\Rightarrow \frac{1}{7} - \frac{1}{8} + \frac{1}{8} - \frac{1}{9} \Rightarrow \frac{1}{2}$$

44. (c) According to the question.

$$\Rightarrow 25 - 5[2 + 3(2 - 2(5 - 3) + 5) - 10] \div 4$$

$$\Rightarrow 25 - 5[2 + 3(2 - 2 \times 2 + 5) - 10] \div 4$$

$$\Rightarrow 25 - 5[2 + 3(2 - 4 + 5) - 10] \div 4$$

$$\Rightarrow 25 - 5[2 + 3 \times 3 - 10] \div 4$$

$$\Rightarrow 25 - 5[11 - 10] \div 4$$

$$\Rightarrow 25 - \frac{5}{4} \Rightarrow \frac{100 - 5}{4}$$

$$\Rightarrow \frac{95}{4} = 23.75$$

45. (d) According to the Question.

$$\Rightarrow 1\frac{2}{3} \div \frac{2}{7} \times \frac{x}{7} = 1\frac{1}{4} \times \frac{2}{3} \div \frac{1}{6}$$

$$\Rightarrow \frac{5}{3} \times \frac{7}{2} \times \frac{x}{7} = \frac{5}{4} \times \frac{2}{3} \times \frac{6}{1}$$

$$\Rightarrow \frac{5x}{6} = 5 \Rightarrow x = 6$$

46. (b) $x = \frac{1}{2 + \frac{1}{2}} = \frac{2}{5} \Rightarrow \frac{1}{x} = \frac{5}{2}$

47. (a) According to the Question

$$\Rightarrow \frac{5}{1\frac{7}{8} \text{ of } 1\frac{1}{3} \times 3\frac{1}{2} \text{ of } 1\frac{1}{4}}$$

$$\Rightarrow \frac{5}{\frac{15}{8} \times \frac{4}{3} \times \frac{21}{10} \times \frac{2}{7} \times \frac{5}{4}}$$

$$\Rightarrow 2 \times \frac{3}{4} \Rightarrow \frac{3}{2} = 1\frac{1}{2}$$

48. (a) According to the Question

$$\Rightarrow \frac{9}{20} - \left[\frac{1}{5} + \frac{1}{4} \left\{ \left(\frac{5}{6} - \frac{1}{3} + \frac{1}{2} \right) \right\} \right]$$

$$\Rightarrow \frac{9}{20} - \left[\frac{1}{5} + \left\{ \frac{1}{4} + \left(\frac{5}{6} - \frac{5}{6} \right) \right\} \right]$$

$$\Rightarrow \frac{9}{20} - \left[\frac{1}{5} + \left\{ \frac{1}{4} + 0 \right\} \right]$$

$$\Rightarrow \frac{9}{20} - \left[\frac{1}{5} + \frac{1}{4} \right]$$

$$\Rightarrow \frac{9}{20} - \frac{9}{20} = 0$$

49. (d) According to the questions

$$\frac{0.8\bar{3} \div 7.5}{2.321 - 0.098}$$

$$\Rightarrow \frac{\frac{83 - 8}{90} \div \frac{75}{10}}{2 + \frac{321 - 3}{990} - \frac{98}{990}}$$

$$\Rightarrow \frac{\frac{75}{90} \times \frac{10}{75}}{2 + \frac{318}{990} - \frac{98}{990}} = \frac{\frac{1}{9}}{2 + \frac{220}{990}} = \frac{\frac{1}{9}}{2 + \frac{2}{9}}$$

$$\Rightarrow \frac{1}{9} \times \frac{9}{20} = \frac{1}{20} = 0.05$$

50. (c) According to the Question

$$\Rightarrow \frac{x}{21} \times \frac{x}{189} = 1$$

$$\Rightarrow x^2 = 21 \times 189$$

$$\Rightarrow x = \sqrt{21 \times 189}$$

$$\Rightarrow x = \sqrt{7 \times 3 \times 7 \times 9 \times 3}$$

$$\Rightarrow x = 7 \times 3 \times 3$$

$$\Rightarrow x = 63$$

51. (b) According to the Question

$$\Rightarrow \sqrt{\frac{(0.1)^2 + (0.01)^2 + (0.009)^2}{(0.01)^2 + (0.001)^2 + (0.0009)^2}}$$

$$\Rightarrow \sqrt{\frac{0.01 + 0.0001 + 0.000081}{0.0001 + 0.000001 + 0.00000081}}$$

$$\Rightarrow \sqrt{\frac{0.010181}{0.00010181}} \Rightarrow \sqrt{100} = 10$$

52. (b) According to the Question.

$$\Rightarrow \sqrt{\frac{(0.03)^2 + (0.21)^2 + (0.065)^2}{(0.003)^2 + (0.021)^2 + (0.0065)^2}}$$

$$\Rightarrow \sqrt{\frac{0.0009 + 0.0441 + 0.004225}{0.000009 + 0.000441 + 0.00004225}}$$

$$\Rightarrow \sqrt{\frac{0.049225}{0.00049225}} \Rightarrow \sqrt{100} = 10$$

53. (b) According to the Question

$$\Rightarrow \sqrt{0.01} + \sqrt{0.81} + \sqrt{1.21} + \sqrt{0.0009}$$

$$\Rightarrow 0.1 + 0.9 + 1.1 + 0.03$$

$$\Rightarrow 2.13$$

54. (c) According to the Question

$$\Rightarrow \sqrt{\frac{(6.1)^2 + (61.1)^2 + (611.1)^2}{(0.61)^2 + (6.11)^2 + (61.11)^2}}$$

$$\Rightarrow \sqrt{\frac{(10 \times 0.61)^2 + (10 \times 6.11)^2 + (10 \times 61.11)^2}{(0.61)^2 + (6.11)^2 + (61.11)^2}}$$

$$\Rightarrow \sqrt{10^2 \left(\frac{(0.61)^2 + (6.11)^2 + (61.11)^2}{(0.61)^2 + (6.11)^2 + (61.11)^2} \right)}$$

$$\Rightarrow \sqrt{10^2} = 10$$

55. (c) According to the Question

$$\Rightarrow \sqrt{0.000441}$$

$$\Rightarrow \sqrt{\frac{441}{1000000}}$$

$$\Rightarrow \frac{21}{1000} = 0.021$$

56. (b) According to the Question

$$\Rightarrow \sqrt{\frac{0.441}{0.625}} \Rightarrow \sqrt{\frac{441}{625}}$$

$$\Rightarrow \frac{21}{25} = 0.84$$

57. (c) According to the Question

$$\Rightarrow \sqrt{\frac{0.342 \times 0.684}{0.000342 \times 0.000171}}$$

$$\Rightarrow \sqrt{\frac{342 \times 684 \times 1000000}{342 \times 171}}$$

$$\Rightarrow \sqrt{4 \times 1000000}$$

$$\Rightarrow 2 \times 1000 = 2000$$

58. (a) According to the Question

$$\Rightarrow \sqrt{0.00060516}$$

$$\Rightarrow \sqrt{\frac{60516}{100000000}}$$

$$\Rightarrow \frac{246}{10000} = 0.0246$$

59. (c) According to the Question.

$$\Rightarrow \sqrt{\frac{9.5 \times 0.085}{0.017 \times 0.019}}$$

$$\Rightarrow \sqrt{\frac{95 \times 85 \times 100}{17 \times 19}}$$

$$\Rightarrow \sqrt{5 \times 5 \times 100}$$

$$\Rightarrow 5 \times 10 = 50$$

60. (b) According to the Question.

$$\Rightarrow \sqrt{248 + \sqrt{52 + \sqrt{144}}}$$

$$\Rightarrow \sqrt{248 + \sqrt{52 + 12}}$$

$$\Rightarrow \sqrt{248 + \sqrt{64}}$$

$$\Rightarrow \sqrt{248 + 8}$$

$$\Rightarrow \sqrt{256}$$

$$\Rightarrow \pm 16$$

61. (d) According to the Question.

$$\Rightarrow \sqrt{104.04} + \sqrt{1.0404} + \sqrt{0.010404}$$

$$\Rightarrow \sqrt{\frac{10404}{100}} + \sqrt{\frac{10404}{10000}} + \sqrt{\frac{10404}{1000000}}$$

$$\Rightarrow \frac{102}{10} + \frac{102}{100} + \frac{102}{1000}$$

$$\Rightarrow 10.2 + 1.02 + 0.102 = 11.322$$

62. (c) According to the Question

$$\Rightarrow \sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$$

$$\Rightarrow \sqrt{\frac{4096}{100}} + \sqrt{\frac{4096}{10000}} + \sqrt{\frac{4096}{1000000}} + \sqrt{\frac{4096}{100000000}}$$

$$\Rightarrow \frac{64}{10} + \frac{64}{100} + \frac{64}{1000} + \frac{64}{10000}$$

$$\Rightarrow 6.4 + 0.64 + 0.064 + 0.0064 = 7.11$$

63. (c) According to the Question.

$$\Rightarrow \frac{3}{5} \text{ of } x^2 = 126.15$$

$$\Rightarrow \frac{3}{5} \times x^2 = 126.15$$

$$\Rightarrow x^2 = \frac{126.15 \times 5}{3}$$

$$\Rightarrow x^2 = 210.25 \Rightarrow x = 14.5$$

64. (a) According to the Question.

As we know that the square of 252 is which that is near to the value of 63522

$$\therefore 63522 - x = 63504$$

$$x = 18$$

65. (d) According to Question

$$\begin{array}{r|l} 4 & 20184 \\ \hline 3 & 5046 \\ 2 & 1682 \\ 29 & 841 \\ 29 & 29 \\ \hline & 1 \end{array}$$

Factors are $2, 2, 3, 2, 29, 29$

$\therefore$ It should be multiplied by = 6

$\Rightarrow$ To make it a perfect square

66. (c) According to the Question.

$$\Rightarrow \sqrt[3]{175.616} + \sqrt[3]{0.175616} + \sqrt[3]{0.000175616}$$

$$\Rightarrow \sqrt[3]{\frac{175616}{1000}} + \sqrt[3]{\frac{175616}{1000000}} + \sqrt[3]{\frac{175616}{1000000000}}$$

$$\Rightarrow \frac{56}{10} + \frac{56}{100} + \frac{56}{1000}$$

$$\Rightarrow 5.6 + 0.56 + 0.056 = 6.216$$

67. (c) According to the Question.

$$\Rightarrow \frac{5}{3 + \frac{3}{1 - \frac{2}{3}}} \Rightarrow \frac{5}{3 + \frac{3}{\frac{1}{3}}}$$

$$\Rightarrow \frac{5}{3 + 9} \Rightarrow \frac{5}{12}$$

68. (b) According to the Question.

$$\text{If } 2 = x + \frac{1}{1 + \frac{1}{3 + \frac{1}{4}}}$$

$$\Rightarrow 2 = x + \frac{1}{1 + \frac{1}{12 + 1}}$$

$$\Rightarrow 2 = x + \frac{1}{1 + \frac{1}{13}}$$

$$\Rightarrow 2 = x + \frac{13}{17}$$

$$\Rightarrow x = 2 - \frac{13}{17}$$

$$\Rightarrow x = \frac{34 - 13}{17}$$

$$\Rightarrow x = \frac{21}{17}$$

69. (d) According to the Question.

$$\Rightarrow \frac{2}{1 + \frac{1}{1 - \frac{1}{2}}} \times \frac{3}{\frac{5}{6} \text{ of } \frac{3}{2} \div 1 \frac{1}{4}}$$

$$\Rightarrow \frac{2}{1 + 2} \times \frac{3}{\frac{5}{6} \times \frac{3}{2} \div \frac{5}{4}}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{4} \div \frac{5}{4}}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{1} \Rightarrow 2$$

70. (b) According to the Question.

$$\Rightarrow 1 + \frac{4}{2 + \frac{3}{5 - \frac{1}{2}}} - \frac{1}{2} (10 \div 2)$$

$$\Rightarrow 1 + \frac{4}{2 + \frac{3 \times 2}{10 - 1}} - \frac{1}{2} \times 5$$

$$\Rightarrow 1 + \frac{4}{2 + \frac{6}{9}} - \frac{5}{2}$$

$$\Rightarrow 1 + \frac{4 \times 9}{18 + 6} - \frac{5}{2}$$

$$\Rightarrow 1 + \frac{36}{24} - \frac{5}{2} \Rightarrow 1 + \frac{3}{2} - \frac{5}{2}$$

$$\Rightarrow \frac{2+3-5}{2} = 0$$

71. (c) According to the question

$$\frac{\left[\left(1 + \frac{1}{10 + \frac{1}{10}} \right) \times \left(1 + \frac{1}{10 + \frac{1}{10}} \right) - \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \times \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right]}{\left[\left(1 + \frac{1}{10 + \frac{1}{10}} \right) + \left(1 - \frac{1}{10 + \frac{1}{10}} \right) \right]}$$

$$\text{Let } 1 + \frac{1}{10 + \frac{1}{10}} = \frac{111}{101} = a$$

$$1 - \frac{1}{10 + \frac{1}{10}} = \frac{91}{101} = b$$

$$\Rightarrow \frac{a^2 - b^2}{a + b} \quad [\because a^2 - b^2 = (a + b)(a - b)]$$

$$\Rightarrow \frac{(a + b)(a - b)}{a + b} \Rightarrow (a - b)$$

$$\Rightarrow \frac{111}{101} - \frac{91}{101} \Rightarrow \frac{20}{101}$$

72. (c) According to the Question.

$$\text{If } \frac{1120}{\sqrt{P}} = 80$$

$$\Rightarrow \frac{1120}{80} = \sqrt{P}$$

$$\Rightarrow \sqrt{P} = 14$$

Squaring both sides

$$\Rightarrow P = 196$$

73. (c) According to the Question.

$$\frac{3\frac{1}{4} - \frac{4}{5} \text{ of } \frac{5}{6}}{4\frac{1}{3} \div \frac{1}{5} - \left(\frac{3}{10} + 21\frac{1}{5} \right)} - \left(1\frac{2}{3} \text{ of } 1\frac{1}{2} \right)$$

$$\Rightarrow \frac{\frac{13}{4} - \frac{4}{5} \times \frac{5}{6}}{\frac{13}{3} \times 5 - \left(\frac{3}{10} + \frac{106}{5} \right)} - \left(\frac{5}{3} \times \frac{3}{2} \right)$$

$$\Rightarrow \frac{\frac{13}{4} - \frac{2}{3}}{\frac{65}{3} - \left(\frac{3 + 212}{10} \right)} - \frac{5}{2}$$

$$\Rightarrow \frac{\frac{39-8}{12}}{\frac{65}{3} - \frac{215}{10}} - \frac{5}{2}$$

$$\Rightarrow \frac{\frac{31}{12}}{\frac{650-645}{30}} - \frac{5}{2}$$

$$\Rightarrow \frac{31}{12} \times \frac{30}{5} - \frac{5}{2}$$

$$\Rightarrow \frac{31}{2} - \frac{5}{2} \Rightarrow \frac{26}{2} = 13$$

74. (b) According to the Question

$$\frac{\left[3\frac{1}{4} \div \left\{ 1\frac{1}{4} - \frac{1}{2} \left(2\frac{1}{2} - \frac{1}{4} - \frac{1}{6} \right) \right\} \right]}{\frac{1}{2} \text{ of } 4\frac{1}{3}}$$

$$\Rightarrow \frac{\left[\frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{5}{2} - \frac{1}{12} \right) \right\} \right]}{\frac{1}{2} \text{ of } \frac{13}{3}}$$

$$\Rightarrow \frac{\left[\frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{30-1}{12} \right) \right\} \right]}{\frac{13}{6}}$$

$$\Rightarrow \frac{\left[\frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \times \frac{29}{12} \right\} \right]}{\frac{13}{6}}$$

$$\Rightarrow \frac{\left[\frac{13}{4} \div \left\{ \frac{30-29}{24} \right\} \right]}{\frac{13}{6}} \Rightarrow \frac{\left[\frac{13}{4} \div \frac{1}{24} \right]}{\frac{13}{6}}$$

$$\Rightarrow \frac{13}{4} \times \frac{24}{1} \times \frac{6}{13} = 36$$

75. (b) According to the Question.

$$\Rightarrow \frac{0.1 \times 0.1 \times 0.1 + 0.2 \times 0.2 \times 0.2 + 0.3 \times 0.3 \times 0.3 - 3 \times 0.1 \times 0.2 \times 0.3}{0.1 \times 0.1 + 0.2 \times 0.2 + 0.3 \times 0.3 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1}$$

As we know that,

$$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

$$\Rightarrow \frac{(0.1)^3 + (0.2)^3 + (0.3)^3 - 3 \times 0.1 \times 0.2 \times 0.3}{(0.1)^2 + (0.2)^2 + (0.3)^2 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1}$$

$$\Rightarrow \frac{[0.1 + 0.2 + 0.3][(0.1)^2 + (0.2)^2 + (0.3)^2 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1]}{[(0.1)^2 + (0.2)^2 + (0.3)^2 - 0.1 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.1]}$$

$$\Rightarrow 0.1 + 0.2 + 0.3 = 0.6$$

76. (d) According to the Question

$$\Rightarrow \frac{1}{30} + \frac{1}{42} + \frac{1}{56} + \frac{1}{72} + \frac{1}{90} + \frac{1}{110}$$

$$\Rightarrow \frac{1}{5} - \frac{1}{6} + \frac{1}{6} - \frac{1}{7} + \frac{1}{7} - \frac{1}{8} + \frac{1}{8} - \frac{1}{9} + \frac{1}{9} - \frac{1}{10} + \frac{1}{10} - \frac{1}{11}$$

$$\Rightarrow \frac{1}{5} - \frac{1}{11} \Rightarrow \frac{11-5}{55} \Rightarrow \frac{6}{55}$$

77. (b) According to the question,

$$I = \frac{3}{4} \div \frac{5}{6}$$

$$I = \frac{3}{4} \times \frac{6}{5} = \frac{9}{10}$$

$$II = 3 \div [(4 \div 5) \div 6]$$

$$II = 3 \div \left[\frac{4}{5} \times \frac{1}{6} \right]$$

$$II = 3 \times \frac{30}{4}$$

$$II = \frac{45}{2}$$

$$III = [3 \div (4 \div 5)] \div 6$$

$$III = \left[3 \times \frac{5}{4} \right] \times \frac{1}{6}$$

$$III = \frac{5}{8}$$

$$IV = 3 \div 4(5 \div 6)$$

$$IV = 3 \div 4 \times \frac{5}{6}$$

$$IV = 3 \times \frac{6}{20}$$

$$IV = \frac{9}{10}$$

$\therefore$ I and IV are equal.

78. (b) According to the question,

$$1 \div [1 + 1 \div \{1 + 1 \div (1 + 1 \div 2)\}]$$

$$\Rightarrow 1 \div \left[1 + 1 \div \left\{ 1 + 1 \div \left(1 + \frac{1}{2} \right) \right\} \right]$$

$$\Rightarrow 1 \div \left[1 + 1 \div \left\{ 1 + 1 \div \frac{3}{2} \right\} \right]$$

$$\Rightarrow 1 \div \left[1 + 1 \div \left\{ 1 + \frac{2}{3} \right\} \right]$$

$$\Rightarrow 1 \div \left[1 + 1 \div \frac{5}{3} \right] \Rightarrow 1 \div \left[1 + \frac{3}{5} \right]$$

$$\Rightarrow 1 \div \left[\frac{8}{5} \right] \Rightarrow \frac{5}{8}$$

79. (a) According to the question,

$$\frac{\frac{1}{3} \div \frac{1}{3} \times \frac{1}{3}}{\frac{1}{3} \div \frac{1}{3} \text{ of } \frac{1}{3}} - \frac{1}{9}$$

$$\Rightarrow \frac{\frac{1}{3}}{\frac{1}{3} \div \frac{1}{9}} - \frac{1}{9} \Rightarrow \frac{\frac{1}{3}}{\frac{1}{3} \times 9} - \frac{1}{9}$$

$$\Rightarrow \frac{1}{3} - \frac{1}{9} \Rightarrow \frac{1}{9} - \frac{1}{9} = 0$$

80. (d) According to the question,

$$\frac{2\frac{3}{4} \div \frac{7}{8} \times \left(\frac{1}{3} + \frac{1}{4} \right) + \frac{5}{7} \div \frac{3}{4} \text{ of } \frac{3}{7}}{1\frac{5}{6}}$$

$$\Rightarrow \frac{\frac{11}{4} \div \frac{7}{8} \times \frac{7}{12} + \frac{5}{7} \div \frac{3}{4} \times \frac{3}{7}}{\frac{11}{6}}$$

$$\Rightarrow \frac{\frac{3}{2} \times \frac{8}{7} \times \frac{7}{12} + \frac{5}{7} \times \frac{28}{9}}{\frac{11}{6}}$$

$$\Rightarrow 1 + \frac{20}{9}$$

$$\Rightarrow \frac{29}{9} = 3\frac{2}{9}$$

81. (d) According to question,

$$3.\overline{36} - 2.\overline{05} + 1.\overline{33}$$

$$\Rightarrow 3 + \frac{36}{99} - \left(2 + \frac{05}{99} \right) + 1 + \frac{33}{99}$$

$$\Rightarrow 2 + \frac{36}{99} - \frac{05}{99} + \frac{33}{99}$$

$$\Rightarrow 2 + \frac{64}{99} = 2.\overline{64}$$

82. (a) According to the question,

$$\frac{0.9 \times 0.9 \times 0.9 + 0.2 \times 0.2 \times 0.2 + 0.3 \times 0.3 \times 0.3 - 3 \times 0.9 \times 0.2 \times 0.3}{0.9 \times 0.9 + 0.2 \times 0.2 + 0.3 \times 0.3 - 0.9 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.9}$$

As we know that,

$$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

$$\frac{(0.9)^3 + (0.2)^3 + (0.3)^3 - 3 \times 0.9 \times 0.2 \times 0.3}{(0.9)^2 + (0.2)^2 + (0.3)^2 - 0.9 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.9}$$

$$\frac{(0.9 + 0.2 + 0.3)[(0.9)^2 + (0.2)^2 + (0.3)^2 - 0.9 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.9]}{(0.9)^2 + (0.2)^2 + (0.3)^2 - 0.9 \times 0.2 - 0.2 \times 0.3 - 0.3 \times 0.9}$$

$$\Rightarrow 0.9 + 0.2 + 0.3 = 1.4$$

83. (b) According to the question,

$$(0.1)^2 \left\{ 1 - 9(0.16)^2 \right\}$$

$$\Rightarrow \left(\frac{1}{9} \right)^2 \left\{ 1 - 9 \left(\frac{16-1}{90} \right)^2 \right\}$$

$$\Rightarrow \frac{1}{81} \left\{ 1 - 9 \left(\frac{15}{90} \right)^2 \right\}$$

$$\Rightarrow \frac{1}{81} \left\{ 1 - \frac{9}{36} \right\} \Rightarrow \frac{1}{81} \times \frac{3}{4}$$

$$\Rightarrow \frac{1}{108}$$

84. (c) According to the question,

$$\frac{1 + \frac{1}{2} \div \frac{4}{7} \left(\frac{2}{5} + \frac{3}{10} \right)}{1 - \frac{1}{2}} \text{ of } \frac{\frac{1}{2} + \frac{1}{3}}{\frac{1}{2} - \frac{1}{3}}$$

$$\Rightarrow \frac{\frac{3}{2} \div \frac{4}{7} \left(\frac{20+15}{50} \right)}{\frac{1}{2}} \times \frac{\frac{5}{6}}{\frac{1}{6}}$$

$$\Rightarrow \frac{3}{2} \times \frac{2}{1} \div \frac{4}{7} \times \frac{35}{50} \times \frac{5}{6} \times \frac{6}{1}$$

$$\Rightarrow \frac{3}{2} \times \frac{2}{1} \div 2$$

$$\Rightarrow \frac{3}{2} \times 2 \times \frac{1}{2} \Rightarrow \frac{3}{2}$$

85. (c) According to the question,

$$[0.9 - \{2.3 - 3.2 - (7.1 - 5.4 - 3.5)\}]$$

$$\Rightarrow [0.9 - \{2.3 - 3.2 + 1.8\}]$$

$$\Rightarrow [0.9 - 0.9] = 0$$

86. (b) According to the question,

$$(32)^3 + (79)^3 - (111)^3 + 3 \times 32 \times 79 \times 111$$

We know that,

$$a^3 + b^3 + c^3 - 3abc = 0$$

When $(a+b+c) = 0$

$$\text{Here, } a = 32, \quad b = 79, \quad c = -111$$

$$a+b+c = 32 + 79 - 111 = 0$$

$$\therefore (32)^3 + (79)^3 - (111)^3 + 3 \times 32 \times 79 \times 111 = 0$$

87. (b) According to the question,

$$\left(\frac{5}{2} + \frac{3}{2} \right) \left(\frac{25}{4} - \frac{15}{4} + \frac{9}{4} \right)$$

$$\Rightarrow \frac{8}{2} \left(\frac{25 - 15 + 9}{4} \right)$$

$$\Rightarrow \frac{8}{2} \times \frac{19}{4} = 19$$

88. (a) According to the question,

$$(0.2 \times 0.2 + 0.01)(0.1 \times 0.1 + 0.02)^{-1}$$

$$\Rightarrow \frac{0.2 \times 0.2 + 0.01}{0.1 \times 0.1 + 0.02}$$

$$\Rightarrow \frac{0.04 + 0.01}{0.01 + 0.02}$$

$$\Rightarrow \frac{0.05}{0.03} = \frac{5}{3}$$

89. (c) According to the question,

$$\frac{1}{2} + \left\{ 4\frac{3}{4} - \left(3\frac{1}{6} - 2\frac{1}{3} \right) \right\}$$

$$\Rightarrow \frac{1}{2} + \left\{ \frac{19}{4} - \left(\frac{19}{6} - \frac{7}{3} \right) \right\}$$

$$\Rightarrow \frac{1}{2} + \left\{ \frac{19}{4} - \left(\frac{19-14}{6} \right) \right\}$$

$$\Rightarrow \frac{1}{2} + \left\{ \frac{19}{4} - \frac{5}{6} \right\} \Rightarrow \frac{1}{2} + \frac{47}{12}$$

$$\Rightarrow \frac{6+47}{12} \Rightarrow 4\frac{5}{12}$$

90. (a) According to the question,

$$\frac{1}{8} + \frac{1}{8^2} + \frac{1}{8^3} + \frac{1}{8^4} + \frac{1}{8^5}$$

$$\Rightarrow \frac{1}{8} + \frac{1}{64} + \frac{1}{512} + \frac{1}{4096} + \frac{1}{32768}$$

$$\Rightarrow 0.125 + 0.015625 + 0.00195313 + 0.00024414 + 0.0000305175 = 0.143$$

91. (d) According to the question,

$$\sqrt{\left[(12.1)^2 - (8.1)^2 \right] \div \left[(0.25)^2 + (0.25)(19.95) \right]}$$

$$\sqrt{\frac{(12.1 + 8.1)(12.1 - 8.1)}{(0.25)^2 + (0.25)(19.95)}}$$

$$\therefore (a^2 - b^2) = (a+b)(a-b)$$

$$\Rightarrow \sqrt{\frac{20.2 \times 4}{0.25[0.25 + 19.95]}}$$

$$\Rightarrow \sqrt{\frac{20.2 \times 4}{0.25 \times 20.2}}$$

$$\Rightarrow \sqrt{\frac{4 \times 100}{25}}$$

$$\Rightarrow \frac{2 \times 10}{5} = 4$$

92. (b) According to the question,

$$\frac{0.051 \times 0.051 \times 0.051 + 0.041 \times 0.041 \times 0.041}{0.051 \times 0.051 - 0.051 \times 0.041 + 0.041 \times 0.041}$$

We know that,

$$a^3 + b^3 = (a+b)(a^2 + b^2 - ab)$$

$$\Rightarrow \frac{(0.051)^3 + (0.041)^3}{(0.051)^2 + (0.041)^2 - 0.051 \times 0.041}$$

$$\frac{[0.051 + 0.041][(0.051)^2 + (0.041)^2 - 0.051 \times 0.041]}{(0.051)^2 + (0.041)^2 - 0.051 \times 0.041}$$

$$\Rightarrow 0.051 + 0.041 = 0.092$$

93. (a) According to the question,

$$\sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + \sqrt{49}}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + 7}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{36}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + 6}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{25}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + 5}} \Rightarrow \sqrt{5 + \sqrt{16}}$$

$$\Rightarrow \sqrt{9} = 3$$

94. (d) According to the question,

$$\frac{(75.8)^2 - (55.8)^2}{20}$$

$$[\because a^2 - b^2 = (a-b)(a+b)]$$

$$\Rightarrow \frac{(75.8 + 55.8)(75.8 - 55.8)}{20}$$

$$\Rightarrow \frac{(131.6) \times 20}{20} = 131.6$$

95. (b) According to the question,

$$\Rightarrow \frac{4 - \sqrt{0.04}}{4 + \sqrt{0.4}} \Rightarrow \frac{4 - 0.2}{4 + 0.632}$$

$$\Rightarrow \frac{3.8}{4.632} = 0.8$$

96. (b) According to the question,

$$\sqrt{0.00004761}$$

$$\Rightarrow \sqrt{\frac{4761}{100000000}}$$

$$\Rightarrow \frac{69}{10000} = 0.0069$$

97. (a) According to the question,

$$\Rightarrow \frac{\sqrt{2} - 1}{\sqrt{2} + 1}$$

Rationalize above equation,

$$\Rightarrow \frac{\sqrt{2} - 1}{\sqrt{2} + 1} \times \frac{\sqrt{2} - 1}{\sqrt{2} - 1}$$

$$\Rightarrow \frac{2 + 1 - 2\sqrt{2}}{1}$$

$$\Rightarrow 3 - 2 \times 1.414$$

$$\Rightarrow 3 - 2.828 = 0.172$$

98. (b) According to the question,

$$\sqrt{\frac{0.00001225}{0.00005329}}$$

$$\Rightarrow \sqrt{\frac{1225}{5329}} \Rightarrow \frac{35}{73}$$

99. (d) According to the question,

$$\sqrt{0.00005746}$$

$$\Rightarrow \sqrt{\frac{5746}{100000000}} \Rightarrow \frac{75.8}{10000}$$

$$= 0.00758$$

100. (b) According to the question,

$$\sqrt{(0.798)^2 + 0.404 \times 0.798 + (0.202)^2} + 1 = ?$$

$$\sqrt{(0.798)^2 + (0.202)^2 + 2 \times 0.202 \times 0.798} + 1$$

$$\Rightarrow \sqrt{(0.798 + 0.202)^2} + 1$$

$$[\because (a+b)^2 = a^2 + b^2 + 2ab]$$

$$\Rightarrow \sqrt{(1)^2} + 1 \Rightarrow 1 + 1 = 2$$

101. (c) According to the question,

$$\sqrt{11.981 + 7\sqrt{1.2996}}$$

$$\Rightarrow \sqrt{\frac{11981}{1000} + \frac{114}{100} \times 7}$$

$$\Rightarrow \sqrt{\frac{11981}{1000} + \frac{798}{100}}$$

$$\Rightarrow \sqrt{\frac{19961}{1000}} \Rightarrow 4.467 = 4.5$$

102. (a) According to the question,
Multiple of 11 whose square roots are whole number.

$$\text{First: } 11 \times 11 = 121$$

$$= \sqrt{121} = 11$$

$$\text{Second: } 11 \times 11 \times 4 = 484$$

$$= \sqrt{484} = 22$$

There are only two numbers.

103. (b) According to the question,

As we know that 324 is a perfect square of 18.

$$\therefore 0.000326 - 0.000002$$

$$= 0.000324$$

104. (d) According to the question,

$$\Rightarrow \sqrt[3]{\frac{7}{875}} \Rightarrow \sqrt[3]{\frac{1}{125}} \Rightarrow \frac{1}{5}$$

105. (b) According to the question,

3	1440
3	480
2	160
2	80
2	40
2	20
2	10
5	5
	1

Factors are:

$$3 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5$$

To make a perfect cube it should be multiplied by $3 \times 2 \times 5 \times 5 = 150$

$$\text{Sum} = 1 + 5 + 0 = 6$$

106. (b) According to the question,

$$90 \times A = \text{perfect cube.}$$

In this question go through option to save your valuable time.

$\therefore$ Option: (b)

$$A = 300$$

$$90 \times 300 = 27000$$

(Perfect cube of 30)

107. (a) According to the question,

$$\frac{5\frac{9}{14}}{5 + \frac{3}{3 + \frac{1}{\frac{3}{5}}}}$$

$$\Rightarrow \frac{5\frac{9}{14}}{5 + \frac{3}{3 + \frac{5}{3}}} \Rightarrow \frac{79}{5 + \frac{9}{14}} \Rightarrow \frac{79}{\frac{79}{14}} = 1$$

108. (d) According to the question,

$$\frac{2}{2 + \frac{2}{3 + \frac{2}{3 + \frac{2}{3}}}} \times 0.39$$

$$\Rightarrow \frac{2}{2 + \frac{2}{3 + \frac{6}{11}}} \times 0.39$$

$$\Rightarrow \frac{2}{2 + \frac{22}{39} \times 0.39}$$

$$\Rightarrow \frac{2}{2 + \frac{22}{100}} \Rightarrow \frac{200}{222} = \frac{100}{111}$$

109. (d) According to the question,

$$1 + \frac{1}{1 + \frac{1}{2}}$$

$$\Rightarrow 1 + \frac{1}{\frac{3}{2}} \Rightarrow 1 + \frac{2}{3} \Rightarrow \frac{5}{3}$$

110. (c) According to the question,

$$\Rightarrow 8.7 - [7.6 - \{6.5 - (5.4 - 4.3 - 2)\}]$$

$$\Rightarrow 8.7 - [7.6 - \{6.5 - (5.4 - 2.3)\}]$$

$$\Rightarrow 8.7 - [7.6 - \{6.5 - 3.1\}]$$

$$\Rightarrow 8.7 - [7.6 - 3.4]$$

$$\Rightarrow 8.7 - 4.2 \Rightarrow 4.5$$

111. (b) According to the question,

As we know that

$$a + b + c = 0 \text{ then}$$

$$a^3 + b^3 + c^3 - 3abc = 0$$

$$\therefore ((0.111)^3 + (0.222)^3 + (-0.333)^3 - 3 \times 0.111 \times 0.222 \times (-0.333))^3 = 0$$

112. (d) According to the question,

$$\Rightarrow \frac{1\frac{1}{4} \div 1\frac{1}{2}}{\frac{1}{15} + 1 - \frac{9}{10}}$$

$$\Rightarrow \frac{\frac{5}{4} \div \frac{3}{2}}{\frac{2}{2} + 30 - 27} = \frac{\frac{5}{4} \times \frac{2}{3}}{\frac{5}{30}}$$

$$\Rightarrow \frac{5}{6} \times \frac{30}{5} = 5$$

113. (b) According to the question,

$$\Rightarrow \frac{-\frac{1}{2} - \frac{2}{3} + \frac{4}{5} - \frac{1}{3} + \frac{1}{5} + \frac{3}{4}}{\frac{1}{2} + \frac{2}{3} - \frac{4}{3} + \frac{1}{3} - \frac{1}{5} - \frac{4}{5}}$$

$$\Rightarrow \frac{-30 - 40 + 48 - 20 + 12 + 45}{15 + 20 - 40 + 10 - 6 - 24}$$

$$\Rightarrow \frac{60}{30}$$

$$\Rightarrow \frac{15}{60} \times \frac{-30}{25} = \frac{-3}{10}$$

114. (b) According to the question,

$$\Rightarrow 0.\overline{63} + 0.\overline{37} + 0.\overline{80}$$

$$\Rightarrow \frac{63}{99} + \frac{37}{99} + \frac{80}{99} = 1.\overline{81}$$

115. (d) According to the question,

$$\text{Let } a = 4.53 - 3.07$$

$$b = 3.07 - 2.15$$

$$c = 2.15 - 4.53$$

$$a + b + c = 0$$

$$\therefore a^3 + b^3 + c^3 = 3abc$$

$$\Rightarrow \frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$$

$$\Rightarrow \frac{a^3 + b^3 + c^3}{abc}$$

$$\Rightarrow \frac{3abc}{abc} = 3$$

116. (b) According to the question,

$$\Rightarrow \frac{17}{15} \times \frac{17}{15} + \frac{2}{15} \times \frac{2}{15} - \frac{17}{15} \times \frac{4}{15}$$

$$\Rightarrow \left(\frac{17}{15}\right)^2 + \left(\frac{2}{15}\right)^2 - 2 \times \frac{17}{15} \times \frac{2}{15}$$

$$\Rightarrow \left(\frac{17}{15} - \frac{2}{15}\right)^2$$

$$\Rightarrow \left(\frac{15}{15}\right)^2 \Rightarrow (1)^2 = 1$$

[$\therefore (a-b)^2 = a^2 + b^2 - 2ab$]

117. (d) According to the question,

$$\Rightarrow \sqrt{\frac{0.25}{0.0009}} \times \sqrt{\frac{0.09}{0.36}}$$

$$\Rightarrow \sqrt{\frac{25}{9} \times 100} \times \sqrt{\frac{9}{36}}$$

$$\Rightarrow \frac{5 \times 10}{3} \times \frac{3}{6} = \frac{25}{3}$$

$$\Rightarrow 8\frac{1}{3}$$

118. (b) According to the question,

$$\Rightarrow \sqrt{0.4} \Rightarrow \sqrt{\frac{4}{9}}$$

$$\Rightarrow \frac{2}{3} \Rightarrow 0.666666..... \Rightarrow 0.\overline{6}$$

119. (c) According to the question,

$$\Rightarrow \sqrt{32} - \sqrt{128} + \sqrt{50}$$

$$\Rightarrow \sqrt{16 \times 2} - \sqrt{64 \times 2} + \sqrt{25 \times 2}$$

$$\Rightarrow 4\sqrt{2} - 8\sqrt{2} + 5\sqrt{2}$$

$$\Rightarrow \sqrt{2} = 1.414$$

120. (d) According to the question,

$$\Rightarrow \sqrt{(7+3\sqrt{5})(7-3\sqrt{5})}$$

$$\Rightarrow \sqrt{49 - 45} \Rightarrow \sqrt{4} = 2$$

121. (c) According to the question,

$$\Rightarrow \sqrt{400} + \sqrt{0.0400} + \sqrt{0.000004}$$

$$\Rightarrow 20 + 0.2 + 0.002 = 20.202$$

122. (c) According to the question,

$$\Rightarrow \sqrt{192} - \frac{1}{2}\sqrt{48} - \sqrt{75}$$

$$\Rightarrow 8\sqrt{3} - \frac{4}{2}\sqrt{3} - 5\sqrt{3}$$

$$\Rightarrow 8\sqrt{3} - 2\sqrt{3} - 5\sqrt{3}$$

$$\Rightarrow \sqrt{3} = 1.732$$

123. (c) According to the question,

$$\Rightarrow \sqrt{\frac{48.4}{0.289}} \Rightarrow \sqrt{\frac{484}{289}} \times 100$$

$$\Rightarrow \frac{22}{17} \times 10 \Rightarrow \frac{220}{17} = 12\frac{16}{17}$$

124. (c) Let the number be = x

According to the question,

$$\Rightarrow x^2 = (75.15)^2 - (60.12)^2$$

$$\Rightarrow x^2 = (75.15 + 60.12)(75.15 - 60.12)$$

$$\Rightarrow x^2 = 135.27 \times 15.03$$

$$\Rightarrow x^2 = 2033.1081$$

$$\Rightarrow x = 45.09$$

125. (b) According to the question,

$$\Rightarrow x^2 + y^2 = 386$$

$$\Rightarrow (5)^2 + (y)^2 = 386$$

$$\Rightarrow (y)^2 = 386 - 25$$

$$\Rightarrow y^2 = 361 \Rightarrow y = 19$$

126. (a) According to the question,

$$\Rightarrow (22)^3 + (-15)^3 + (-7)^3$$

$$\Rightarrow 10648 - 3375 - 343 = 6930$$

Alternate

$$a = 22$$

$$b = -15$$

$$c = -7$$

$$a + b + c = 0$$

$$\text{So, } a^3 + b^3 + c^3 = 3abc$$

$$3 \times -15 \times -7 \times 22 = 6930$$

127. (c) According to the question,

2	1800
2	900
2	450
15	225
15	15
	1

Factors are: $2 \times 2 \times 2 \times 5 \times 5 \times 3 \times 3$
the smallest number multiplied by = $5 \times 3 = 15$

$$\text{Sum of the digits} = 1 + 5 = 6$$

128. (a) According to the question,

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{2}{3} \text{ of } 1\frac{1}{4}}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \left(\frac{2}{3} \times \frac{5}{4}\right)}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{\frac{5}{6} \div \frac{5}{6}} \Rightarrow \frac{2}{3} \times \frac{3}{1} = 2$$

129. (d) According to the question,

$$\Rightarrow \left(4\frac{11}{15} + \frac{15}{71}\right)^2 - \left(4\frac{11}{15} - \frac{15}{71}\right)^2$$

$$(a^2 - b^2) = (a-b)(a+b)$$

$$\Rightarrow \left(4\frac{11}{15} + \frac{15}{71} + 4\frac{11}{15} - \frac{15}{71}\right) \left(4\frac{11}{15} + \frac{15}{71} - 4\frac{11}{15} + \frac{15}{71}\right)$$

$$\Rightarrow \left(2 \times 4\frac{11}{15}\right) \left(2 \times \frac{15}{71}\right)$$

$$\Rightarrow \left(2 \times \frac{71}{15} \times 2 \times \frac{15}{71}\right) \Rightarrow 4$$

130. (a) According to the question,

$$\Rightarrow \frac{0.1 \times 0.1 \times 0.1 + 0.02 \times 0.02 \times 0.02}{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04}$$

$$\Rightarrow \frac{0.001 + 0.000008}{0.008 + 0.000064} \Rightarrow \frac{0.001008}{0.008064}$$

$$\Rightarrow \frac{1008}{8064} = \frac{1}{8} = 0.125$$

131. (a) According to the question,

$$\Rightarrow 5\frac{3}{x} \times 3\frac{1}{2} = 19$$

$$\Rightarrow \left(\frac{5x+3}{x}\right) \times \frac{7}{2} = 19$$

$$\Rightarrow \frac{5x+3}{x} = \frac{38}{7}$$

$$\Rightarrow 35x + 21 = 38x$$

$$\Rightarrow 3x = 21 \Rightarrow x = 7$$

132. (c) According to the question,

$$\Rightarrow \left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)^2 [\because (a+b)^2 = a^2 + b^2 + 2ab]$$

$$\Rightarrow (\sqrt{2})^2 + \left(\frac{1}{\sqrt{2}}\right)^2 + 2 \times \sqrt{2} \times \frac{1}{\sqrt{2}}$$

$$\Rightarrow 2 + \frac{1}{2} + 2 \Rightarrow \frac{4+1+4}{2}$$

$$\Rightarrow \frac{9}{2} = 4\frac{1}{2}$$

133. (d) According to the question,

$$\begin{aligned} &\Rightarrow (0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02 - 1 \\ &= (0.98)^3 + (0.02)^3 + 3 \times 0.98 \times 0.02(0.98 + 0.02) - 1 \\ &\quad [\because (a+b)^3 = a^3 + b^3 + 3ab(a+b)] \end{aligned}$$

$$\Rightarrow (0.98 + 0.02)^3 - 1$$

$$\Rightarrow (1)^3 - 1 = 0$$

Alternate:

$$a = 0.98$$

$$b = 0.02$$

$$c = -1$$

$$a+b+(-c) = 0$$

$$\text{So, } a^3+b^3+(-c)^3-3abc = 0$$

134. (c) According to the question,

$$\Rightarrow 71 \times 29 + 27 \times 15 + 8 \times 4$$

$$\Rightarrow 2059 + 405 + 32 = 2496$$

135. (b) According to the question,

$$\Rightarrow 0.05 \times 5 - 0.005 \times 5$$

$$\Rightarrow 0.25 - 0.025 = 0.225$$

136. (a) According to the question

$$\Rightarrow \sqrt[3]{\frac{0.2 \times 0.2 \times 0.2 + 0.04 \times 0.04 \times 0.04}{0.4 \times 0.4 \times 0.4 + 0.08 \times 0.08 \times 0.08}}$$

$$\Rightarrow \sqrt[3]{\frac{0.008 + 0.000064}{0.064 + 0.000512}}$$

$$\Rightarrow \sqrt[3]{\frac{0.008064}{0.064512}} \Rightarrow \sqrt[3]{\frac{8064}{64512}}$$

$$\Rightarrow \sqrt[3]{\frac{1}{8}} \Rightarrow \frac{1}{2} = 0.5$$

137. (b) According to the question,

$$\Rightarrow \sqrt{\frac{\left(3\frac{1}{4}\right)^4 - \left(4\frac{1}{3}\right)^4}{\left(3\frac{1}{4}\right)^2 - \left(4\frac{1}{3}\right)^2}}$$

$$\Rightarrow \sqrt{\frac{\left[\left(3\frac{1}{4}\right)^2 + \left(4\frac{1}{3}\right)^2\right] \left[\left(3\frac{1}{4}\right)^2 - \left(4\frac{1}{3}\right)^2\right]}{\left(3\frac{1}{4}\right)^2 - \left(4\frac{1}{3}\right)^2}}$$

$$\Rightarrow \sqrt{\left(\frac{13}{4}\right)^2 + \left(\frac{13}{3}\right)^2}$$

$$\Rightarrow \sqrt{\frac{169}{16} + \frac{169}{9}} \Rightarrow \sqrt{\frac{1521 + 2704}{144}}$$

$$\Rightarrow \sqrt{\frac{4225}{144}} \Rightarrow \frac{65}{12} = 5\frac{5}{12}$$

138. (a) As we know square of 825 is 680625.

$\therefore$ The smallest number added to 680621 to make a perfect square is 4.

139. (d) According to the question,

$$\begin{array}{r} 2 \overline{) 392} \\ 2 \overline{) 196} \\ 2 \overline{) 98} \\ 7 \overline{) 49} \\ 7 \overline{) 7} \\ \hline 1 \end{array}$$

Factors are: $2 \times 2 \times 2 \times 7 \times 7$

Smallest number is = 2

140. (c) We know that square of 47 is 2209.

$\therefore$ The smallest number added to 2203 to make a perfect square is 6.

141. (a) According to the question,

$$\Rightarrow (975)^2 - (585)^2$$

$$\Rightarrow (975 + 585)(975 - 585)$$

$$\Rightarrow 1560 \times 390$$

$$\Rightarrow 608400 = (780)^2 \Rightarrow 780$$

142. (d) According to the question,

Let two numbers are x & y.

$$\therefore x + y = 20 \quad \dots(i)$$

$$x - y = 8 \quad \dots(ii)$$

Solve eq. (i) and eq. (ii)

$$x = 14$$

$$y = 6$$

$$\therefore x^2 - y^2 = (14)^2 - (6)^2$$

$$= 196 - 36 = 160$$

143. (c) According to the question,

Let the two numbers are x & y.

$$\therefore x^2 + y^2 = 100 \quad \dots(i)$$

$$x^2 - y^2 = 28 \quad \dots(ii)$$

Solve eq.(i) and (ii)

$$x = 8$$

$$y = 6$$

$$\therefore x + y = 8 + 6 = 14$$

144. (b) As we know the cube of 9 is 729.

Therefore 19 must be added to 710 to make it a perfect cube.

145. (d) According to the question,

$$\Rightarrow \frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{4}}}} \Rightarrow \frac{1}{3 + \frac{1}{1 + \frac{4}{1 + \frac{1}{9}}}}$$

$$\Rightarrow \frac{1}{3 + \frac{9}{13}} \Rightarrow \frac{13}{48} \text{ Satisfied}$$

146. (c) According to the question,

$$\Rightarrow 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{2}{1 + \frac{2}{3}}}}}$$

$$\Rightarrow 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{3}{1 + \frac{5}{5}}}}}$$

$$\Rightarrow 1 + \frac{1}{1 + \frac{1}{1 + \frac{5}{1 + \frac{8}{8}}}} \Rightarrow 1 + \frac{1}{1 + \frac{8}{13}}$$

$$\Rightarrow 1 + \frac{13}{21} \Rightarrow \frac{34}{21}$$

147. (d) According to the question,

$$\Rightarrow \frac{(3.63)^2 - (2.37)^2}{3.63 + 2.37}$$

$$\Rightarrow \frac{(3.63 + 2.37)(3.63 - 2.37)}{(3.63 + 2.37)}$$

$$[\because a^2 - b^2 = (a - b)(a + b)]$$

$$\Rightarrow 3.63 - 2.37 = 1.26$$

148. (d) According to the question,

First number is $8^2 = 64$
 Last number is $31^2 = 961$
 $\therefore$ Total number are $= 31 - 7 = 24$

149. (d) Let the four consecutive natural numbers are 1, 2, 3, 4

According to the question,
 $\Rightarrow 1 \times 2 \times 3 \times 4 = 24 + 1 = 25 = 5^2$
 $\therefore 2 \times 3 \times 4 \times 5 = 120 + 1 = 121 = 11^2$
 $\therefore P = 1$

150. (a) According to the question,

$$\Rightarrow (256)^{0.16} \times (16)^{0.18}$$

$$\Rightarrow (2^8)^{0.16} \times (2^4)^{0.18}$$

$$\Rightarrow (2)^{1.28} \times (2)^{0.72}$$

$$\Rightarrow (2)^{1.28 + 0.72} \Rightarrow (2)^2 = 4$$

151. (d) According to the question,

$$\Rightarrow \left(\frac{1}{3.5} + \frac{1}{5.7} + \frac{1}{7.9} + \frac{1}{9.11} + \frac{1}{11.13} + \frac{1}{13.15} \right)$$

$$\Rightarrow \frac{1}{2} \left(\frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \frac{1}{9} + \frac{1}{11} + \frac{1}{13} + \frac{1}{15} \right)$$

$$\Rightarrow \frac{1}{2} \left[\frac{1}{3} - \frac{1}{15} \right] \Rightarrow \frac{1}{2} \left[\frac{5-1}{15} \right]$$

$$\Rightarrow \frac{1}{2} \times \frac{4}{15} = \frac{2}{15}$$

152. (c) According to the question,

$$\Rightarrow 53 \times 87 + 159 \times 21 + 106 \times 25$$

$$\Rightarrow 4611 + 3339 + 2650 = 10600$$

153. (c) According to the question,

$$\Rightarrow \sqrt{6 \ 2 \ 5 \ 6 \ 8 \ 6 \ 7 \ 3 \ 4 \ 4 \ 8 \ 9} = 6$$

Note: For counting the digits of square root we make pairs first. Then the digits will be equal to number of pairs.

154. (b) As we know that square of 95 is 9025. Therefore smallest number which should be added to number 8958 to make a perfect square is 67.

155. (c) According to the question,

$$\Rightarrow \sqrt{\frac{8}{3}} \Rightarrow \sqrt{\frac{8 \times 3}{3 \times 3}} \Rightarrow \sqrt{\frac{24}{9}}$$

$$\Rightarrow \frac{4.898}{3} = 1.633$$

156. (b) Let the number of boys = x
 the number of girls = y

According to the question,

$$\Rightarrow x^2 - y^2 = 28 \quad \dots(i)$$

$$\Rightarrow x = y + 2$$

$$\Rightarrow x - y = 2 \quad \dots(ii)$$

From eq. (i)

$$\Rightarrow x^2 - y^2 = 28$$

$$\Rightarrow (x + y)(x - y) = 28$$

$$\Rightarrow (x + y) \times 2 = 28$$

$$\Rightarrow x + y = 14$$

157. (d) Let the three consecutive numbers are x, x + 1, x + 2.

According to the question,

$$\Rightarrow x^2 + (x + 1)^2 + (x + 2)^2 = 110$$

$$\Rightarrow x^2 + x^2 + 1 + 2x + x^2 + 4 + 4x = 110$$

$$\Rightarrow 3x^2 + 6x + 5 = 110$$

$$\Rightarrow 3x^2 + 6x - 105 = 0$$

$$\Rightarrow x^2 + 2x - 35 = 0$$

$$\Rightarrow x^2 + 7x - 5x - 35 = 0$$

$$\Rightarrow x(x + 7) - 5(x + 7) = 0$$

$$\Rightarrow (x + 7)(x - 5) = 0$$

$$\Rightarrow x = 5 \text{ \& } -7$$

($\therefore$ (-) value cannot considered)

$\therefore$ Smallest number is = 5

Alternatively:-

you can also solve using options.

158. (c) According to the question,

whole number is 0, 1, 2, 3,

$\therefore$ Product of two whole number is 37.

$\therefore$ Factors of 37 is = 1×37

$\therefore$ Numbers are = 1, 37

$$\text{The } \sqrt{37-1} = \sqrt{36} = 6$$

159. (c) According to the question,

$$\sqrt[3]{(333)^3 + (333)^3 + (334)^3 - 3 \times 333 \times 333 \times 334}$$

As we know that

$$a^3 + b^3 + c^3 - 3abc$$

$$= \frac{1}{2}(a+b+c) \left[(a-b)^2 + (b-c)^2 + (c-a)^2 \right]$$

$$= \frac{1}{2}(333 + 333 + 334)$$

$$\left[(333-333)^2 + (333-334)^2 + (334-333)^2 \right]$$

$$= \frac{1}{2} \times 1000 [0 + 1 + 1]$$

$$= \frac{1}{2} \times 1000 \times 2 = \sqrt[3]{1000} = 10$$

160. (c) Let two numbers are x & y.

$$x^2 + y^2 = 146$$

$$25 + y^2 = 146$$

$$y^2 = 146 - 25$$

$$y^2 = 121$$

$$y = 11$$

$$\therefore y^3 = (11)^3 = 1331$$

161. (b) According to question

2	1944
2	972
2	486
3	243
3	81
3	27
3	9
3	3
	1

Factors are $= \overbrace{2 \times 2 \times 2}^3 \times \overbrace{3 \times 3 \times 3}^3 \times \overbrace{3 \times 3 \times 3}^3$

$\therefore$ To make a perfect cube it must be multiplied by 3

162. (a) According to the question

$$\Rightarrow \frac{3000}{3} \Rightarrow 1000 = 10^3$$

Note: In such type of question go through option to save your valuable time

163. (b) According to the question

2	864
2	432
6	216
6	36
6	6
	1

Factors are: $\overbrace{2 \times 2}^2 \times \overbrace{3 \times 3 \times 3}^3 \times \overbrace{6 \times 6 \times 6}^3$

Here n = 2

164. (d) According to the question

$$\Rightarrow \frac{0.125 + 0.027}{0.25 - 0.15 + 0.09}$$

$$\Rightarrow \frac{0.152}{0.19} \Rightarrow 0.8$$

Alternate:-

$$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$$

$$\begin{aligned} & \frac{(0.5)^3 + (0.3)^3}{(0.5)^2 - (0.5 \times 0.3) + (0.3)^2} \\ &= 0.5 + 0.3 = 0.8 \end{aligned}$$

165. (d) According to the question

$$\Rightarrow \frac{(7.5)^3 + 1}{(7.5)^2 - 6.5}$$

$$[\because a^3 + b^3 = (a + b)(a^2 + b^2 - ab)]$$

$$\begin{aligned} & \Rightarrow \frac{(7.5+1)[(7.5)^2 + 1 - 7.5 \times 1]}{(7.5)^2 - 7.5 \times 1 + 1^2} \\ & \Rightarrow 8.5 \end{aligned}$$

166. (b) According to question

$$\Rightarrow \frac{(2.697 - 0.498)^2 + (2.697 + 0.498)^2}{2.697 \times 2.697 + 0.498 \times 0.498}$$

$$\text{Let } a = 2.697$$

$$b = 0.498$$

$$\Rightarrow \frac{(a-b)^2 + (a+b)^2}{a^2 + b^2}$$

$$\Rightarrow \frac{a^2 + b^2 - 2ab + a^2 + b^2 + 2ab}{a^2 + b^2}$$

$$\Rightarrow \frac{2(a^2 + b^2)}{a^2 + b^2} \Rightarrow 2$$

167. (d) According to the question

$$\Rightarrow \sqrt{\frac{0.081 \times 0.484}{0.0064 \times 6.25}}$$

$$\Rightarrow \frac{9 \times 22}{8 \times 25} \Rightarrow 0.99$$

168. (c) According to the question.

$$\Rightarrow \sqrt{13} + \sqrt{1300} + \sqrt{0.013}$$

$$\Rightarrow 3.6 + 10\sqrt{13} + \sqrt{\frac{130}{10000}}$$

$$\Rightarrow 3.6 + 10 \times 3.6 + \frac{11.4}{100} = 39.714$$

169. (c) As we know that the square of 316 is 99856

170. (c) According to the question

$$\Rightarrow (68)^2 - (32)^2$$

$$\Rightarrow (68 + 32)(68 - 32)$$

$$[\because a^2 - b^2 = (a + b)(a - b)]$$

$$\Rightarrow 100 \times 36$$

$$\Rightarrow 3600 = (60)^2 = 60$$

171. (a) According to the question

$$\Rightarrow \frac{3\frac{1}{4} - \frac{4}{5} \text{ of } \frac{5}{6}}{4\frac{1}{3} \div \frac{1}{5} - \left(\frac{3}{10} + 21\frac{1}{5}\right)}$$

$$\Rightarrow \frac{\frac{13}{4} - \frac{4}{5} \times \frac{5}{6}}{\frac{13}{3} \times 5 - \left(\frac{3}{10} + \frac{106}{5}\right)}$$

$$\Rightarrow \frac{\frac{13}{4} - \frac{2}{3}}{\frac{65}{3} - \frac{3}{10} - \frac{106}{5}} \Rightarrow \frac{\frac{39-8}{12}}{\frac{650-9-636}{30}}$$

$$\Rightarrow \frac{31}{12} \times \frac{30}{5} = \frac{31}{2} = 15\frac{1}{2}$$

$\therefore$ Least fraction number

should be subtracted is: $15\frac{1}{2} -$

$$15 = \frac{1}{2} \text{ (least fraction number)}$$

172. (b) According to question

$$\Rightarrow \sqrt[2]{0.014 \times 0.14x}$$

$$= 0.014 \times 0.14 \sqrt[2]{xy}$$

Squaring both sides

$$\Rightarrow 0.014 \times 0.14x$$

$$= (0.014)^2 \times (0.14)^2 \times y$$

$$\Rightarrow \frac{x}{y} = 0.014 \times 0.14$$

$$\Rightarrow \frac{x}{y} = 0.00196$$

173. (a) According to the question

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + \sqrt{49}}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{29 + 7}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + \sqrt{36}}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{19 + 6}}}$$

$$\Rightarrow \sqrt{5 + \sqrt{11 + \sqrt{25}}} \Rightarrow$$

$$\sqrt{5 + \sqrt{11 + 5}}$$

$$\Rightarrow \sqrt{5 + \sqrt{16}} \Rightarrow \sqrt{5 + 4} \Rightarrow \sqrt{9} = 3$$

174. (c) As we know that square of '31' is 961

$$\therefore 1000 - 961 = 39$$

175. (a) According to the question

$$\Rightarrow \frac{4.41 \times 0.16}{2.1 \times 1.6 \times 0.21} \Rightarrow \frac{0.7056}{0.7056} = 1$$

176. (a) According to the question

$$\Rightarrow 0.1 \times 0.01 \times 0.01 \times 10^7 = 100$$

177. (d) According to the question

$$\Rightarrow \frac{3.25 \times 3.20 - 3.20 \times 3.05}{0.064}$$

$$\Rightarrow \frac{10.4 - 9.76}{0.064} \Rightarrow \frac{0.64}{0.064} = 10$$

178. (d) According to the question

$$\Rightarrow \left[\frac{(0.1)^2 - (0.01)^2}{0.0001} \right] + 1$$

$$\Rightarrow \left[\frac{(0.1 + 0.01)(0.1 - 0.01)}{0.0001} \right] + 1$$

$$\Rightarrow \frac{0.11 \times 0.09}{0.0001} + 1$$

$$\Rightarrow 99 + 1 = 100$$

179. (a) According to the question

$$\Rightarrow 0.5 \times 5 + 0.25 \times 0.5 + 0.5 \times 4 + 0.5 \times 0.75$$

$$\Rightarrow 2.5 + 0.125 + 2 + 0.375 = 5$$

180. (d) According to the question

$$\Rightarrow \frac{(5 + 5 + 5 + 5) \div 5}{3 + 3 + 3 + 3 \div 3}$$

$$\Rightarrow \frac{20 \div 5}{9 + 1} \Rightarrow \frac{4}{10} \Rightarrow \frac{2}{5}$$

181. (c) According to the question

$$\Rightarrow \frac{(100-1)(100-2)(100-3)\dots\dots\dots(100-200)}{100 \times 99 \times 98 \times \dots\dots\dots \times 3 \times 2 \times 1}$$

$$\Rightarrow \frac{99 \times 98 \times 97 \times \dots\dots\dots 1 \times 0 \times 1 \times (-2) \dots\dots\dots (-100)}{100 \times 99 \times 98 \times \dots\dots\dots 3 \times 2 \times 1} = 0$$

182. (a) According to the question

$$\Rightarrow 0.9 \times 0.9 \times 0.9 + 0.1 \times 0.1 \times 0.1$$

$$\Rightarrow 0.729 + 0.001 = 0.73$$

183. (b) According to the question

$$\Rightarrow \sqrt{\frac{0.009 \times 0.036 \times 0.016 \times 0.08}{0.002 \times 0.0008 \times 0.0002}}$$

$$\Rightarrow \sqrt{\frac{9 \times 36 \times 16 \times 8}{2 \times 8 \times 2}}$$

$$\Rightarrow 3 \times 6 \times 2 = 36$$

184. (b) According to the question

$$\Rightarrow \sqrt{1\frac{1}{4} \times \frac{64}{125} \times 1.44} \Rightarrow \sqrt{\frac{5}{4} \times \frac{64}{125} \times \frac{144}{100}}$$

$$\Rightarrow \frac{1}{2} \times \frac{8}{5} \times \frac{12}{10} \Rightarrow \frac{24}{25}$$

185. (a) According to the question

$$\Rightarrow 2\sqrt{54} - 6\sqrt{\frac{2}{3}} - \sqrt{96}$$

$$\Rightarrow 6\sqrt{6} - 2\sqrt{\frac{2}{3} \times 9} - 4\sqrt{6}$$

$$\Rightarrow 6\sqrt{6} - 2\sqrt{6} - 4\sqrt{6} \Rightarrow 0$$

186. (d) According to the question

$$\Rightarrow \frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}} \Rightarrow \frac{2\sqrt{6} + 6\sqrt{6}}{4\sqrt{6}}$$

$$\Rightarrow \frac{8\sqrt{6}}{4\sqrt{6}} \Rightarrow 2$$

187. (d) According to the question

$$\Rightarrow \sqrt{110 + \frac{1}{4}} \Rightarrow \sqrt{\frac{441}{4}} = \frac{21}{2}$$

$$\Rightarrow 10.5$$

188. (c) As we know that the square of 32 is 1024

189. (c) According to the question

The square of 11 = 121

The square of 17 = 289

The square of 18 = 324

∴ Perfect square lie between 120 & 300

11, 12 17 = total no. 7

190. (c) According to the question

$$\Rightarrow 7 < (2x - 3) < 17$$

Check through option to save your valuable time

$$\therefore x = 9$$

$$2x - 3 = 2 \times 9 - 3 = 15$$

$$\Rightarrow 7 < 15 < 17 \text{ (Satisfied)}$$

191. (c) According to the question

$$\Rightarrow x^2 + x = 2450$$

$$\Rightarrow x(x + 1) = 49 \times 50 = 2450$$

$$\Rightarrow \therefore x = 49$$

192. (d) According to the question

$$\Rightarrow \sqrt[3]{\sqrt{0.000064}} \Rightarrow \sqrt[3]{0.008}$$

$$\Rightarrow 0.2$$

193. (b) According to the question

$$\Rightarrow \sqrt[3]{15612 + \sqrt{154 + \sqrt{225}}}$$

$$\Rightarrow \sqrt[3]{15612 + \sqrt{154 + 15}}$$

$$\Rightarrow \sqrt[3]{15612 + \sqrt{169}} \Rightarrow \sqrt[3]{15612 + 13}$$

$$\Rightarrow \sqrt[3]{15625} \Rightarrow 25$$

194. (c) According to the question

$$\Rightarrow \sqrt[3]{0.000125} \Rightarrow 0.05$$

195. (a) According to the question

$$\Rightarrow \sqrt[3]{1000} + \sqrt[3]{0.008} - \sqrt[3]{0.125}$$

$$\Rightarrow 10 + 0.2 - 0.5 \Rightarrow 9.7$$

196. (b) According to the question

5	675
5	135
3	27
3	9
3	3
	1

Factors are = $\overbrace{5 \times 5} \times \overbrace{3 \times 3 \times 3}$

∴ It must be multiplied by 5 to make a perfect cube.

197. (b) According to the question

As we know that the cube of 12 is 1728

∴ 8 must be added to the 1720 to make a perfect cube

198. (b) According to the question

3	4320
3	1440
3	480
2	160
2	80
2	40
2	20
2	10
5	5
	1

Factors are :

$$\overbrace{3 \times 3 \times 3} \times \overbrace{2 \times 2 \times 2} \times \overbrace{2 \times 2 \times 2} \times 5$$

∴ It must be multiplied by

$$= 2 \times 5 \times 5 = 50$$

$$199. (b) \frac{3a+4b}{3a-4b} = \frac{3c+4d}{3c-4d}$$

$$= \frac{3a}{4b} = \frac{3c}{4d}$$

$$= ad = bc$$

200. (a) According to the question

$$\Rightarrow \frac{2\frac{1}{3} - 1\frac{2}{11}}{3 + \frac{1}{3 + \frac{1}{3}}} \Rightarrow \frac{7\frac{1}{3} - \frac{13}{11}}{3 + \frac{1}{\frac{10}{3}}}$$

$$\Rightarrow \frac{77 - 39}{33} \Rightarrow \frac{38}{33} \times \frac{33}{109} \Rightarrow \frac{38}{109}$$

201. (b) According to the question

$$\Rightarrow 3 + \frac{3}{3 + \frac{1}{3 + \frac{1}{3}}} \Rightarrow 3 + \frac{3}{3 + \frac{3}{10}}$$

$$\Rightarrow 3 + \frac{3 \times 10}{33} \Rightarrow 3 + \frac{10}{11} \Rightarrow \frac{43}{11}$$

202. (a) According to the question

$$\Rightarrow 1 + \frac{1}{1 + \frac{1}{5}} \Rightarrow 1 + \frac{1}{\frac{6}{5}}$$

$$\Rightarrow 1 + \frac{5}{6} \Rightarrow \frac{11}{6}$$

203. (d) According to the question

$$\Rightarrow \frac{(3.2)^3 - 0.008}{(3.2)^2 + 0.64 + 0.04}$$

$$\Rightarrow \frac{(3.2)^3 - (0.2)^3}{(3.2)^2 + 0.64 + 0.04}$$

$$[\because a^3 - b^3 = (a-b)(a^2 + ab + b^2)]$$

$$\Rightarrow \frac{(3.2 - 0.2)[(3.2)^2 + (0.2)^2 + 3.2 \times 0.2]}{(3.2)^2 + 3.2 \times 0.2 + (0.2)^2}$$

$$\Rightarrow 3.2 - 0.2 = 3$$

204. (a) According to the question

$$\Rightarrow \frac{\frac{1}{3} + \frac{1}{4} \left[\frac{2}{5} - \frac{1}{2} \right]}{1\frac{2}{3} \text{ of } \frac{3}{4} - \frac{3}{4} \text{ of } \frac{4}{5}}$$

$$\Rightarrow \frac{\frac{1}{3} + \frac{1}{4} \left[\frac{4-5}{10} \right]}{\frac{5}{3} \times \frac{3}{4} - \frac{3}{4} \times \frac{4}{5}} \Rightarrow \frac{\frac{1}{3} - \frac{1}{4} \times \frac{1}{10}}{\frac{5}{4} - \frac{3}{5}}$$

$$\Rightarrow \frac{40 - 3}{120} \Rightarrow \frac{37}{120} \times \frac{20}{13} \Rightarrow \frac{37}{78}$$

205. (b) According to the question

$$\Rightarrow \frac{0.04}{0.03} \text{ of } \left(3\frac{1}{3} - 2\frac{1}{2} \right) \div \frac{1}{2} \text{ of } 1\frac{1}{4}$$

$$\frac{1}{3} + \frac{1}{5} \text{ of } \frac{1}{9}$$

$$\Rightarrow \frac{4}{3} \times \left(\frac{10}{3} - \frac{5}{2} \right) \div \frac{1}{2} \times \frac{5}{4}$$

$$\frac{1}{3} + \frac{1}{5} \times \frac{1}{9}$$

$$\Rightarrow \frac{4}{3} \times \frac{\left(\frac{20-15}{6}\right) \times \frac{8}{5}}{\frac{1}{3} + \frac{1}{45}}$$

$$\Rightarrow \frac{4}{3} \times \frac{\frac{5}{6} \times \frac{8}{5}}{\frac{15+1}{45}} \Rightarrow \frac{4}{3} \times \frac{\frac{8}{6}}{\frac{16}{45}}$$

$$\Rightarrow \frac{4}{3} \times \frac{8}{6} \times \frac{45}{16} = 5)$$

206.(b) Let the 3 consecutive positive numbers = x, x + 1, x + 2

According to the question

$$\Rightarrow x^2 + (x+1)^2 + (x+2)^2 = 365$$

$$\Rightarrow x^2 + x^2 + 1 + 2x + x^2 + 4 + 4x = 365$$

$$\Rightarrow 3x^2 + 6x - 360 = 0$$

$$\Rightarrow x^2 + 2x - 120 = 0$$

$$\Rightarrow x^2 + 2x = 120$$

$$\Rightarrow x(x+2) = 120$$

$$\Rightarrow x(x+2) = 10 \times 12 = 120$$

$$\therefore x = 10$$

$$\text{Sum of the numbers} = 10+11+12 = 33$$

207.(a) According to the question

$$\Rightarrow \sqrt{8 + \sqrt{57 + \sqrt{38 + \sqrt{108 + \sqrt{169}}}}}$$

$$\Rightarrow \sqrt{8 + \sqrt{57 + \sqrt{38 + \sqrt{108 + 13}}}}$$

$$\Rightarrow \sqrt{8 + \sqrt{57 + \sqrt{38 + \sqrt{121}}}}$$

$$\Rightarrow \sqrt{8 + \sqrt{57 + \sqrt{38 + 11}}}$$

$$\Rightarrow \sqrt{8 + \sqrt{57 + \sqrt{49}}}$$

$$\Rightarrow \sqrt{8 + \sqrt{57 + 7}} \Rightarrow \sqrt{8 + \sqrt{64}}$$

$$\Rightarrow \sqrt{8 + 8} \Rightarrow \sqrt{16} = 4$$

208.(c) According to the question

$$p - q = 5 \quad \dots\dots(i)$$

$$p^2 + q^2 = 55 \quad \dots\dots(ii)$$

$$\therefore (p-q)^2 = p^2 + q^2 - 2pq$$

$$(5)^2 = 55 - 2pq$$

$$25 = 55 - 2pq$$

$$2pq = 30 \Rightarrow pq = 15$$

209.(d) Let two numbers are x and y

According to the question

$$xy = 45$$

$$x-y = 4$$

$$\therefore (x-y)^2 = x^2 + y^2 - 2xy$$

$$\Rightarrow x^2 + y^2 = (x-y)^2 + 2xy$$

$$\Rightarrow x^2 + y^2 = 16 + 90$$

$$\Rightarrow x^2 + y^2 = 106$$

210.(b) According to the question

$$\Rightarrow \sqrt[3]{1 - \frac{127}{343}} \Rightarrow \sqrt[3]{\frac{343 - 127}{343}}$$

$$\Rightarrow \sqrt[3]{\frac{216}{343}} = \frac{6}{7} = 1 - \frac{1}{7}$$

211.(c) According to the question

$$\Rightarrow \frac{0.3555 \times 0.5555 \times 2.025}{0.225 \times 1.7775 \times 0.2222}$$

$$\Rightarrow \frac{3555 \times 5555 \times 2025}{225 \times 17775 \times 2222} = 4.5$$

212.(b) According to the question

$$\Rightarrow 100 \times 10 - 100 + 2000 \div 100$$

$$\Rightarrow 1000 - 100 + 20 = 920$$

213.(d) According to question

$$\Rightarrow \frac{547.527}{0.0082} = x$$

$$\Rightarrow \frac{547527}{82} \times 10 = x$$

$$\Rightarrow \frac{547527}{82} = \frac{x}{10}$$

214.(c) According to question

$$= \sqrt{\frac{0.324 \times 0.081 \times 4.624}{1.5625 \times 0.0289 \times 72.9 \times 64}}$$

$$= \sqrt{\frac{324 \times 81 \times 4624}{15625 \times 289 \times 729 \times 64}}$$

[Count the number of digits after decimal in each number in numerator as well as in denominator]

$$= \frac{\sqrt{324} \times \sqrt{81} \times \sqrt{4624}}{\sqrt{15625} \times \sqrt{289} \times \sqrt{729} \times \sqrt{64}}$$

$$= \frac{18 \times 9 \times 68}{125 \times 17 \times 27 \times 8}$$

$$= \frac{3}{125} = 0.024$$

215.(c) According to question

$$\sqrt{0.25 \times 2.25} = \sqrt{0.25} \times \sqrt{2.25}$$

$$= 0.5 \times 1.5 = 0.75$$

216.(b) According to question

$$\therefore \sqrt{18225} = 135$$

$$= \sqrt{18225} + \sqrt{182.25} + \sqrt{1.8225} + \sqrt{0.018225}$$

$$= 135 + \sqrt{\frac{18225}{100}} + \sqrt{\frac{18225}{10000}} + \sqrt{\frac{18225}{1000000}}$$

$$= 135 + \frac{135}{10} + \frac{135}{100} + \frac{135}{1000}$$

$$= 135 + 13.5 + 1.35 + 0.135$$

$$= 149.985$$

217.(b) According to question

$$\sqrt{21 \frac{51}{169}} = \sqrt{\frac{3600}{169}} = \frac{60}{13} = 4 \frac{8}{13}$$

218.(b) According to question

$$(1101)^2 = 1212201$$

$$\sqrt{1212201} = 1101$$

$$\text{Now, } \sqrt{121.2201} = \sqrt{\frac{1212201}{10000}}$$

$$\frac{1101}{100} = 11.01$$

219.(a) According to question

$$= \sqrt{\frac{0.064 \times 0.256 \times 15.625}{0.025 \times 0.625 \times 4.096}}$$

$$= \frac{\sqrt{64} \times \sqrt{256} \times \sqrt{15625}}{\sqrt{25} \times \sqrt{625} \times \sqrt{4096}}$$

$$= \frac{8 \times 16 \times 125}{5 \times 25 \times 64} = 2$$

220.(b) Let the numbers be x and y (x > y) According to Question,

$$x^2 - y^2 = 45$$

$$(x+y)(x-y) = 45$$

Make factor of 45

$$\left. \begin{array}{l} 15 \times 3 \\ 9 \times 5 \\ 45 \times 1 \end{array} \right\} 3 \text{ pairs}$$

These pairs gives the value of x and y which satisfy the given condition.

221. (a) According to the question,

$$\sqrt[3]{3^n} = 27$$

$$(3^n)^{\frac{1}{3}} = (3)^3$$

$$\frac{n}{3} = (3)^3$$

$$\frac{n}{3} = 3$$

$$n = 9$$

222. (c) Take a first part

$$\frac{4\frac{2}{7} - \frac{1}{2}}{3\frac{1}{2} + 1\frac{1}{7}} = \frac{\frac{30}{7} - \frac{1}{2}}{\frac{7}{2} + \frac{8}{7}} = \frac{\frac{60-7}{14}}{\frac{49+16}{14}} = \frac{53}{65}$$

Second part

$$\begin{aligned} \frac{1}{2 + \frac{1}{2 + \frac{1}{5 - \frac{1}{5}}}} &= \frac{1}{2 + \frac{1}{2 + \frac{1}{\frac{24}{5}}}} \\ &= \frac{1}{2 + \frac{1}{2 + \frac{5}{24}}} = \frac{1}{2 + \frac{1}{\frac{53}{24}}} = \frac{1}{2 + \frac{24}{53}} \\ &= \frac{1}{\frac{130}{53}} = \frac{53}{130} \end{aligned}$$

According to question,

$$\begin{aligned} \frac{53}{65} \div \frac{53}{130} &= \frac{53}{65} \times \frac{130}{53} = \frac{130}{65} = 2 \end{aligned}$$

223. (c) $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$

$$= 4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{\frac{9}{4}}}} = 4 - \frac{5}{1 + \frac{1}{3 + \frac{4}{9}}}$$

$$= 4 - \frac{5}{1 + \frac{1}{3 + \frac{4}{9}}} = 4 - \frac{5}{1 + \frac{1}{\frac{31}{9}}}$$

$$= 4 - \frac{5}{1 + \frac{9}{31}} = 4 - \frac{5}{\frac{40}{31}}$$

$$= 4 - \frac{5 \times 31}{40} = 4 - \frac{31}{8} = \frac{1}{8}$$

According to question

$$\frac{1}{8} \text{ part} = 10 \text{ minutes}$$

$$1 \text{ part} = 80 \text{ minutes}$$

$$\frac{3}{5} \text{ part} = 80 \times \frac{3}{5} = 48 \text{ minutes}$$

224. (a) Take first part

$$= \frac{4\frac{1}{7} - 2\frac{1}{4}}{3\frac{1}{2} + 1\frac{1}{7}} = \frac{\frac{29}{7} - \frac{9}{4}}{\frac{7}{2} + \frac{8}{7}}$$

$$= \frac{\frac{116-63}{28}}{\frac{49+16}{14}} = \frac{53}{28} \times \frac{14}{65} = \frac{53}{130}$$

Take second part

$$\begin{aligned} \frac{1}{2 + \frac{1}{2 + \frac{1}{5 - \frac{1}{5}}}} &= \frac{1}{2 + \frac{1}{2 + \frac{1}{\frac{25-1}{5}}}} \\ &= \frac{1}{2 + \frac{1}{2 + \frac{5}{24}}} = \frac{1}{2 + \frac{1}{\frac{53}{24}}} = \frac{1}{\frac{106+24}{53}} = \frac{53}{130} \end{aligned}$$

According to the question

$$\sqrt{\frac{53}{130} \div \frac{53}{130}} = \sqrt{\frac{53}{130} \times \frac{130}{53}} = \sqrt{1} = 1$$

$$225. (c) 1 + \frac{1}{1 + \frac{2}{3 + \frac{1}{5}}} = 1 + \frac{1}{1 + \frac{2}{\frac{19}{5}}}$$

$$= 1 + \frac{1}{1 + \frac{10}{19}} = 1 + \frac{1}{\frac{29}{19}}$$

$$= 1 + \frac{19}{29} = \frac{48}{29}$$

$$226. (c) \frac{1}{1+2^{a-b}} + \frac{1}{1+2^{b-a}}$$

$$= \frac{1}{1+2^{a-b}} + \frac{1}{1+2^{-(a-b)}}$$

$$= \frac{1}{1+2^{a-b}} + \frac{2^{a-b}}{2^{a-b}+1} = \frac{1+2^{a-b}}{1+2^{a-b}} = 1$$

$$227. (a) 3\frac{1}{2} - \left[2\frac{1}{4} \div \left\{ 1\frac{1}{4} - \frac{1}{2} \left(1\frac{1}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

$$= \frac{7}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

$$= \frac{7}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \times 1 \right\} \right]$$

$$= \frac{7}{2} - \left[\frac{9}{4} \div \frac{3}{4} \right] = \frac{7}{2} - \left[\frac{9}{4} \times \frac{4}{3} \right]$$

$$= \frac{7}{2} - 3 = \frac{7-6}{2} = \frac{1}{2}$$

$$228. (b) \left(3\frac{3}{5} \times 3\frac{3}{5} \right) + \left(2 \times 3\frac{3}{5} \times \frac{2}{5} \right) + \left(\frac{2}{5} \times \frac{2}{5} \right)$$

$$= \frac{18}{5} \times \frac{18}{5} + 2 \times \frac{18}{5} \times \frac{2}{5} + \frac{2}{5} \times \frac{2}{5}$$

$$= \left(\frac{18}{5} \right)^2 + 2 \times \left(\frac{18}{5} \right) \times \left(\frac{2}{5} \right) + \left(\frac{2}{5} \right)^2$$

$$= \left(\frac{18}{5} + \frac{2}{5} \right)^2 = \left(\frac{20}{5} \right)^2 = 4^2 = 16$$

$$229. (b) \left(1 - \frac{1}{n+1} \right) + \left(1 - \frac{2}{n+1} \right) +$$

$$\left(1 - \frac{3}{n+1} \right) + \dots + \left(1 - \frac{n}{n+1} \right)$$

$$= n - \frac{1+2+3+\dots+n}{n+1}$$

$$= n - \frac{n(n+1)}{2(n+1)}$$

$$\left\{ 1+2+3+\dots+n = \frac{n(n+1)}{2} \right\}$$

$$= n - \frac{n}{2} = \frac{n}{2}$$

$$230. (a) 5\frac{1}{3} \div 1\frac{2}{9} \times \frac{1}{4} \left(10 + \frac{3}{1 - \frac{1}{5}} \right)$$

$$= \frac{16}{3} \div \frac{11}{9} \times \frac{1}{4} \left(10 + \frac{3}{\frac{4}{5}} \right)$$

$$= \frac{16}{3} \div \frac{11}{9} \times \frac{1}{4} \times \left(10 + \frac{15}{4} \right)$$

$$= \frac{16}{3} \times \frac{9}{11} \times \frac{1}{4} \times \frac{55}{4}$$

$$= \frac{48}{11} \times \frac{1}{4} \times \frac{55}{4} = 15$$

$$231. (d) \frac{1}{3-\sqrt{8}} = \frac{3+\sqrt{8}}{(3-\sqrt{8})(3+\sqrt{8})}$$

$$= \frac{3+\sqrt{8}}{9-8} = 3+\sqrt{8}$$

Now, According to question

$$= 3+\sqrt{8}+3+\sqrt{8}-6-4\sqrt{2}$$

$$= 6+2\sqrt{8}-6-4\sqrt{2}$$

$$= 2\sqrt{8}-4\sqrt{2} = 4\sqrt{2}-4\sqrt{2} = 0$$

$$232. (c) \frac{\sqrt{24}+\sqrt{216}}{\sqrt{96}}$$

$$= \frac{\sqrt{2 \times 2 \times 6} + \sqrt{6 \times 6 \times 6}}{\sqrt{4 \times 4 \times 6}}$$

$$= \frac{2\sqrt{6} + 6\sqrt{6}}{4\sqrt{6}} = \frac{8}{4} = 2$$

$$233. (d) \sqrt{3 \frac{33}{64}} \div \sqrt{9 \frac{1}{7}} \times 2\sqrt{3 \frac{1}{9}}$$

$$= \sqrt{\frac{225}{64}} \div \sqrt{\frac{64}{7}} \times 2\sqrt{\frac{28}{9}}$$

$$= \sqrt{\frac{225}{64} \times \frac{7}{64} \times \frac{28}{9}} \times 2$$

$$= \frac{5 \times 7}{8 \times 4} \times 2 = \frac{35}{16}$$

$$= 2 \frac{3}{16}$$

$$234. (b) \frac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}} = \frac{\sqrt{4 \times 4 \times 2} + \sqrt{4 \times 4 \times 3}}{\sqrt{2 \times 2 \times 2} + \sqrt{2 \times 2 \times 3}}$$

$$= \frac{4\sqrt{2}+4\sqrt{3}}{2\sqrt{2}+2\sqrt{3}} = \frac{4(\sqrt{2}+\sqrt{3})}{2(\sqrt{2}+\sqrt{3})}$$

$$= \frac{4}{2} = 2$$

235. (a) Number of digits in
62478078 = 8

∴ Number of digits in its square
root = 4

236. (d) If $n^r - tn + \frac{1}{4}$ to be a perfect
square
 $r = 2 \quad t = \pm 1$

(If $t = 1$) $n^2 - n + \frac{1}{4} = n^2 - 2 \times n \times$

$$\frac{1}{2} + \frac{1}{4} = \left(n - \frac{1}{2}\right)^2$$

(If $t = -1$) $n^2 + n + \frac{1}{4} = n^2 + 2 \times n \times$

$$\frac{1}{2} + \frac{1}{4} = \left(n + \frac{1}{2}\right)^2$$

237. (d) $33 - 4\sqrt{35}$

$$= 33 - 2 \times 2\sqrt{35}$$

$$= 33 - 2 \times 2 \times \sqrt{7} \times \sqrt{5}$$

$$= 28 + 5 - 2 \times 2\sqrt{7} \times \sqrt{5}$$

$$= (2\sqrt{7})^2 + (\sqrt{5})^2 - 2 \times 2\sqrt{7} \times \sqrt{5}$$

$$= (2\sqrt{7} - \sqrt{5})^2$$

$$\sqrt{33 - 4\sqrt{35}} = \pm \sqrt{(2\sqrt{7} - \sqrt{5})^2}$$

$$= \pm (2\sqrt{7} - \sqrt{5})$$

238. (c) $\sqrt{156.25} + \sqrt{0.0081} - \sqrt{0.0361}$

$$= \sqrt{\frac{15625}{100}} + \sqrt{\frac{81}{10000}} - \sqrt{\frac{361}{10000}}$$

$$= \frac{125}{10} + \frac{9}{100} - \frac{19}{100}$$

$$= 12.5 + 0.09 - 0.19 = 12.4$$

239. (d) $\sqrt{24010000} = \sqrt{2401 \times 10000}$

$$= 49 \times 100$$

Again, square root

$$\sqrt{49 \times 100} = 7 \times 10 = 70$$

$$\sqrt[4]{24010000} = 70$$

240. (c) Greatest 4 digit no. = 9999

$$\begin{array}{r} 9 \overline{) 9999} \quad | 99 \\ \underline{81} \\ 189 \\ \underline{180} \\ 90 \\ \underline{81} \\ 9 \\ \underline{9} \\ 0 \end{array}$$

Greatest four digit number is a
perfect square = $9999 - 198 = 9801$

241. (a) $(a-b)^2 = a^2 + b^2 - 2ab$

$$16a^2 - 12a = (4a)^2 - 2 \times 4a \times$$

$$\frac{3}{2} + \left(\frac{3}{2}\right)^2$$

Number be added = $\left(\frac{3}{2}\right)^2 = \frac{9}{4}$

242. (a) $(\sqrt{4^3+15^2})^3$

$$= (\sqrt{64+225})^3 = (\sqrt{289})^3$$

$$= (17)^3 = 4913$$

243. (b) $\sqrt[3]{4 \frac{12}{125}} = \sqrt[3]{\frac{512}{125}}$

$$= \sqrt[3]{\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}{5 \times 5 \times 5}}$$

$$= \frac{2 \times 2 \times 2}{5} = \frac{8}{5} = 1.6$$

244. (b) $x[-2\{-4(-a)\}] + 5[-2\{-2(-a)\}] = 4a$

$$x[-2\{4a\}] + 5[-2\{2a\}] = 4a$$

$$x[-8a] + 5[-4a] = 4a$$

$$-8ax - 20a = 4a$$

$$-8ax = 24a$$

$$x = -\frac{24a}{8a}$$

$$x = -3$$

245. (a) $\begin{array}{r} 4 \overline{) 1728} \quad | 42 \\ \underline{16} \\ 82 \\ \underline{82} \\ 0 \\ \underline{0} \\ 0 \end{array}$

Least no. must be added is a per-
fect square = $1728+36 = 1764$

1764 is perfect square of 42.

246. (a) $a = 64$, $b = 289$

$$\sqrt{a} = 8, \sqrt{b} = 17$$

$$\therefore (\sqrt{a} + \sqrt{b} - \sqrt{b} - \sqrt{a})^{\frac{1}{2}}$$

$$= (\sqrt{8+17} - \sqrt{17-8})^{\frac{1}{2}}$$

$$= (\sqrt{25} - \sqrt{9})^{\frac{1}{2}}$$

$$= (5-3)^{1/2} = 2^{\frac{1}{2}}$$

247. (c) $\sqrt{64009} = 253$

$$\begin{array}{r|l} 2 & 64009 \quad | 253 \\ \hline & 4 \\ \hline 45 & 240 \\ \hline & 225 \\ \hline 503 & 1509 \\ \hline & 1509 \\ \hline & \times \end{array}$$

by square root method

248. (b) Let the no. of days be x

According to question

$$x \times x = 361$$

$$x^2 = 361$$

$$x = 19 \text{ days}$$

249. (b) $\sqrt{10^{-6} \times 0.25}$

$$= 10^{-3} \times 0.5$$

$$= \frac{0.5}{1000} = 0.0005$$

250. (d) $\frac{3\sqrt{2}}{\sqrt{3}+\sqrt{6}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$

$$= \frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} \times \frac{\sqrt{6}-\sqrt{3}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}} \times \frac{\sqrt{6}-\sqrt{2}}{\sqrt{6}-\sqrt{2}}$$

$$+ \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

$$= \frac{3\sqrt{2}(\sqrt{6}-\sqrt{3})}{3} - \frac{4\sqrt{3}(\sqrt{6}-\sqrt{2})}{4}$$

$$+ \frac{\sqrt{6}(\sqrt{3}-\sqrt{2})}{1}$$

$$= 2\sqrt{3} - \sqrt{6} - 3\sqrt{2} + \sqrt{6} + 3\sqrt{2} - 2\sqrt{3}$$

$$= 0$$

251. (b) $\frac{4 - \sqrt{0.04}}{4 + \sqrt{0.36}}$

$$= \frac{4 - 0.2}{4 + 0.6} = \frac{3.8}{4.6} = \frac{38}{46} = \frac{19}{23} = 0.8$$

252. (b) $\sqrt{0.05 \times 0.5 \times a} = 0.5 \times 0.05 \times \sqrt{b}$

Squaring both sides

$$0.05 \times 0.5 \times a = 0.5 \times 0.5 \times 0.05 \times 0.05 \times b$$

$$a = 0.5 \times 0.05 \times b$$

$$\frac{a}{b} = \frac{5 \times 5}{10 \times 100}$$

$$\frac{a}{b} = \frac{1}{40} = 0.025$$

253. (a) Let the no. of students in a row be x

According to question

$$x \times x = 1369$$

$$x^2 = 1369$$

$$x = 37$$

254. (a) $(\sqrt{5} + \sqrt{3})^2 = 5 + 3 + 2\sqrt{15} = 8 + 2\sqrt{15}$

$$(\sqrt{6} + \sqrt{2})^2 = 6 + 2 + 2\sqrt{12} = 8 + 2\sqrt{12}$$

$$\sqrt{15} > \sqrt{12}$$

$$= \sqrt{5} + \sqrt{3} > \sqrt{6} + \sqrt{2}$$

= option (a) is correct

255. (d) $\begin{array}{r|l} 2 & 20184 \\ \hline & 10092 \\ \hline & 5046 \\ \hline 3 & 2523 \\ \hline 29 & 841 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$

For making it a perfect square 20184 should be multiplied by

$$2 \times 3 = 6$$

256. (c) $x = \sqrt{3} + \sqrt{2}$

$$\frac{1}{x} = \frac{1}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$

$$\frac{1}{x} = \sqrt{3} - \sqrt{2}$$

$$x^3 - \frac{1}{x^3} = \left(x - \frac{1}{x}\right)^3 + 3 \times x \times \frac{1}{x} \left(x - \frac{1}{x}\right)$$

$$= (\sqrt{3} + \sqrt{2} - \sqrt{3} + \sqrt{2})^3 + 3(\sqrt{3} + \sqrt{2} - \sqrt{3} + \sqrt{2})$$

$$= (2\sqrt{2})^3 + 3(2\sqrt{2})$$

$$= 16\sqrt{2} + 6\sqrt{2} = 22\sqrt{2}$$

257. (a) $(1001)^3$

$$= 1001 \times 1001 \times 1001$$

$$= 1002001 \times 1001$$

$$= 1003003001$$

258. (b) $\begin{array}{r|l} 5 & 625 \\ \hline & 125 \\ \hline & 25 \\ \hline & 5 \\ \hline & 1 \end{array}$

$$625 = 5 \times 5 \times 5 \times 5$$

Smallest number = 5

259. (d) $(\sqrt{6} + \sqrt{10} - \sqrt{21} - \sqrt{35})$

$$(\sqrt{6} - \sqrt{10} + \sqrt{21} - \sqrt{35})$$

$$= ((\sqrt{6} - \sqrt{35}) + (\sqrt{10} - \sqrt{21}))$$

$$((\sqrt{6} - \sqrt{35}) - (\sqrt{10} - \sqrt{21}))$$

$$= (\sqrt{6} - \sqrt{35})^2 - (\sqrt{10} - \sqrt{21})^2$$

$$= 6 + 35 - 2\sqrt{210} - 10 - 21 + 2\sqrt{210}$$

$$= 41 - 31 = 10$$

260. (b) $\frac{1}{a + \frac{1}{b + \frac{1}{c + \frac{1}{2}}}} = \frac{1}{1 + \frac{1}{2 + \frac{1}{3 + \frac{1}{2}}}}$

$$= \frac{16}{23} = \frac{1}{\frac{23}{16}} = \frac{1}{1 + \frac{7}{16}} = \frac{1}{1 + \frac{1}{\frac{16}{7}}}$$

$$= \frac{1}{1 + \frac{1}{2 + \frac{2}{7}}} = \frac{1}{1 + \frac{1}{2 + \frac{1}{\frac{7}{2}}}} = \frac{1}{1 + \frac{1}{2 + \frac{1}{3 + \frac{1}{2}}}}$$

Found the value of a = 1, b = 2 & c = 3

$$a + b + c = 1 + 2 + 3 = 6$$

261. (d) According to the question

$$x + y = \frac{46}{3} \quad \dots\dots(i)$$

$$x - y = \frac{14}{3} \quad \dots\dots(ii)$$

Solve equation (i) and (ii)

$$x = \frac{30}{3} \quad y = \frac{16}{3}$$

$$\therefore xy = \frac{30}{3} \times \frac{16}{3} = \frac{160}{3} = 53\frac{1}{3}$$

262. (d) According to the question

$$\Rightarrow \frac{(0.013)^2 + (0.007)^3}{(0.013)^2 + (0.007)^2 - 0.007 \times 0.013}$$

$$\Rightarrow \frac{(0.013 + 0.007) \left[\frac{(0.013)^2 + (0.007)^2}{(0.013)^2 + (0.007)^2 - 0.007 \times 0.013} \right]}{(0.013)^2 + (0.007)^2 - 0.007 \times 0.013}$$

$$\Rightarrow 0.02$$

263. (b) According to the question

$$\begin{array}{r} 89 \quad 125 \\ -4 \quad -6 \\ \hline 85 \quad 119 \end{array}$$

17 (H.C.F of two number)

$$\therefore a = 17$$

264. (c) $\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$

Consecutive factor of 12 = 4 × 3

Equation contain positive sign

So, maximum number is answer

4 is answer

265. (d) $x = \sqrt[3]{7} + 3$

$$x - 3 = \sqrt[3]{7}$$

Cubing both sides

$$x^3 - 3^3 - 3 \times x \times 3 (x - 3) = 7$$

$$x^3 - 27 - 9x(x - 3) = 7$$

$$x^3 - 9x^2 + 27x - 34 = 0$$

266. (c) $0.\bar{3} + 0.\bar{6} + 0.\bar{7} + 0.\bar{8} = x$

$$\frac{3}{9} + \frac{6}{9} + \frac{7}{9} + \frac{8}{9} = x$$

$$x = \frac{24}{9} = \frac{8}{3} = 2\frac{2}{3}$$

267. (a) $\frac{1}{\sqrt{11-2\sqrt{30}}} - \frac{3}{\sqrt{7-2\sqrt{10}}} - \frac{4}{\sqrt{8-4\sqrt{3}}}$

$$= \frac{1}{\sqrt{(\sqrt{6}-\sqrt{5})^2}} - \frac{3}{\sqrt{(\sqrt{5}-\sqrt{2})^2}} - \frac{4}{\sqrt{2(4-2\sqrt{3})}}$$

$$= \frac{1}{\sqrt{6}-\sqrt{5}} - \frac{3}{\sqrt{5}-\sqrt{2}} - \frac{4}{(\sqrt{2}) \times \sqrt{(\sqrt{3}+1)^2}}$$

$$= \frac{1}{\sqrt{6}-\sqrt{5}} - \frac{3}{\sqrt{5}-\sqrt{2}} - \frac{2\sqrt{2}}{\sqrt{3}+1}$$

Rationalising all the factors

$$= \sqrt{6} + \sqrt{5} - \frac{3(\sqrt{5} + \sqrt{2})}{5-2} - \frac{2\sqrt{2}(\sqrt{3}-1)}{3-1}$$

$$= \sqrt{6} + \sqrt{5} - \sqrt{5} - \sqrt{2} - \sqrt{6} + \sqrt{2} = 0$$

268. (b) $2^2 + 4^2 + 6^2 + \dots + 40^2 = 11480$
 $2^2(1^2 + 2^2 + 3^2 + \dots + 20^2) = 11480$

$$1^2 + 2^2 + 3^2 + \dots + 20^2 = \frac{11480}{4} = 2870$$

269. (d) $\frac{0.2 \times 0.02 \times 0.002 \times 32}{0.4 \times 0.04 \times 0.004 \times 16}$

$$= \frac{2 \times 2 \times 2 \times 32}{4 \times 4 \times 4 \times 16} = \frac{1}{4} = 0.25$$

270. (a) Let the three consecutive natural number is divisible by three = $x, x+3, x+6$

A.T.Q

$$x + x + 3 + x + 6 = 45$$

$$3x + 9 = 45$$

$$3x = 36$$

$$x = 12$$

Smallest number is 12

271. (a) $1^2 + 3^2 + 5^2 + \dots + 17^2$

$$= (1^2 + 2^2 + 3^2 + 4^2 + \dots + 17^2)$$

$$- (2^2 + 4^2 + \dots + 16^2)$$

$$= (1^2 + 2^2 + 3^2 + 4^2 + \dots + 17^2)$$

$$- 2^2(1^2 + 2^2 + \dots + 8^2)$$

using given formula

$$\left[\frac{P(P+1)(2P+1)}{6} \right]$$

$$= \frac{17 \times 18 \times 35}{6} - 4 \left[\frac{8 \times 9 \times 17}{6} \right]$$

$$= 1785 - 4 \times 204$$

$$= 1785 - 816 = 969$$

272. (a)

$$\left(\frac{1}{\sqrt{9}-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} \right)$$

$$= \sqrt{9} + \sqrt{8} - \sqrt{8} - \sqrt{7} + \sqrt{7} + \sqrt{6}$$

$$- \sqrt{6} - \sqrt{5} = \sqrt{9} - \sqrt{5} = 3 - \sqrt{5}$$

273. (d) $\left[\frac{x^{n+4} \times x^n}{x^{n+2}} \right]$

$$\left[\frac{2 \times 3^{n+4} - 3^{n+2}}{3^{n+2}} \right] = \frac{3^{n+2}(2 \times 3^2 - 1)}{3^{n+2}}$$

$$= [2 \times 9 - 1] = 17$$

274. (c) Unit digit of $252^{126} + 244^{152}$
 $= 4 + 6 = 10$

Hence the remainder = 0

275. (b) $\frac{9}{\sqrt{3}} + 2$

$$= 3\sqrt{3} + 2 = 3 \times 1.732 + 2 = 7.196$$

276. (d) $\frac{(2.3)^3 + 0.027}{(2.3)^2 - 0.69 + 0.09}$

$$= \frac{(2.3 + 0.3)[(2.3)^2 - 0.6 + 0.09]}{(2.3)^2 - 0.69 + 0.09}$$

$$= 2.3 + 0.3 = 2.3 + 0.3 = 2.6$$

277. (c) $6\frac{1}{4}\%$ of 1600 + $12\frac{1}{2}\%$ of 800

$$= \frac{1}{16} \times 1600 + \frac{1}{8} \times 800$$

$$= 100 + 100 = 200$$

278. (d) Boys 391 Girls 323

$$\text{Diff.} = 68$$

Now the HCF of both number will be number of classes 68

$$= 1 \times 68 (\times) = 2 \times 34 (\times)$$

$$= 4 \times 17 (\checkmark) \text{ HCF} = 17$$

279. (a) Total no. of student who wear spectacles

$$= 1400 \times \frac{25}{100} = 350$$

$$= 350 \times \frac{2}{7} = 100 \text{ boys}$$

So, Girls who wear spectacles = $350 - 100 = 250$ girls

280. (a) $3x + 4y = 6$

On squaring both sides

$$9x^2 + 16y^2 + 24xy = 36$$

$$60 + 24xy = 36$$

$$xy = -1$$

281. (b) $1 - \frac{1}{1+\sqrt{2}} + \frac{1}{1-\sqrt{2}}$

$$= 1 - \frac{(\sqrt{2}-1)}{(\sqrt{2}+1)(\sqrt{2}-1)} - \frac{(\sqrt{2}+1)}{(\sqrt{2}-1)(\sqrt{2}+1)}$$

$$= 1 - \sqrt{2} + 1 - \sqrt{2} - 1 = 1 - 2\sqrt{2}$$

282. (c) $0 < x < 1$, Let $x = \frac{4}{10}$

$$\text{So, } \sqrt{x} = \frac{2}{\sqrt{10}}, \& x^2 = \frac{16}{100} = .16$$

$$\text{Now, } \therefore 0.16 < \frac{4}{10} < \frac{2}{\sqrt{10}}$$

$$\therefore x^2 < x < \sqrt{x}$$

283. (c) Let 3 digit No. = $xyz = 100x + 10y + z$

According to the question

$$(100x + 10y + z) - (x + y + z)$$

$$= 99x + 9y = 9(11x + y)$$

Which must be divisible by 3,9.

284. (b) $\frac{2}{3}, \frac{3}{5}, \frac{11}{15}$ (LCM of 3,5,15 = 15)

$$= \frac{2 \times 5}{3 \times 5}, \frac{3 \times 3}{5 \times 3}, \frac{11}{15} = \frac{10}{15}, \frac{9}{15}, \frac{11}{15}$$

$$\text{Now, } \frac{11}{15} > \frac{10}{15} > \frac{9}{15}$$

$$\text{So, } \frac{3}{5} < \frac{2}{3} < \frac{11}{15}$$

285. (a) Let No. are x, y
 given $xy = 900$ (i)
 and $x + y - (x - y) = 60$... (ii)
 $2y = 60$
 $y = 30$
 by equation (i)
 $x \times 30 = 900$
 $x = 60$
 greater No. = 60

286. (d) $2\frac{1}{2}, 3\frac{1}{3}, 4\frac{1}{4}, 5\frac{1}{5}$

to make whole no.

$$= \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$$

(must be whole no.)

$$= \frac{30+20+15+12}{60}$$

$$= \frac{77}{60} = 1 + \frac{17}{60}$$

to make $\frac{17}{60}$ whole no.

$$1 - \frac{17}{60} = \frac{43}{60}$$

should be added

287. (d) $\sqrt[3]{-13824} =$

$$\sqrt[3]{-24 \times (-24) \times (-24)}$$

$$= -24$$

288. (c) Let no. are a, b, c

Given $a + b + c = 18$ (i)

$a \times b \times c = 162$ (ii)

$a + b = c$ (iii)

from equation (i) and (iii)

$$2c = 18$$

$$c = 9$$

$$a \times b \times 9 = 162$$

$$\therefore a \times b = 18$$

$$a + b = 9$$

So, $a, b = 6, 3$

Now,

$$= a^2 + b^2 + c^2 = 6^2 + 3^2 + 9^2$$

$$= 36 + 9 + 81 = 126$$

289. (d) According to the questions

$$d : q : r$$

$$10 : 1 : 2$$

$$\downarrow \times 23 \quad \downarrow \times 23 \quad \downarrow \times 23$$

$$230 \quad 23 \quad 46$$

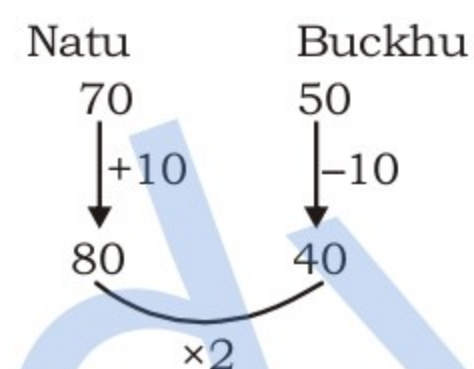
$$\text{dividend} = d \times q + r$$

$$= 230 \times 23 + 46 = 5336$$

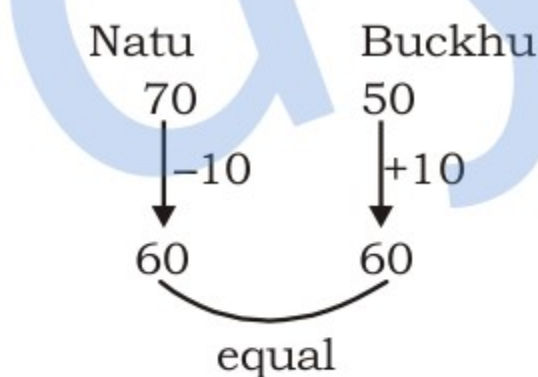
290. (b) Take option B and check the condition.

Let natu have 70 and Buchku have 50 oranges.

Ist condition



IInd condition



So Natu and Buckhu have 70 and 50 oranges respectively.

291. (c) Let 1st basket have x number of oranges.

So IInd basket will have

$(640 - x)$ oranges

Now, According to question

$$x - x \times \frac{1}{5} = (640 - x) + \frac{x}{5}$$

$$x + x - \frac{x}{5} - \frac{x}{5} = 640$$

$$2x - \frac{2x}{5} = 640$$

$$\frac{10x - 2x}{5} = 640$$

$$\frac{8x}{5} = 640$$

$$\boxed{x = 400}$$

Ist basket = 400

IInd basket = $640 - 400 = 240$

$$292. (b) \sqrt[3]{-2197} \times \sqrt[3]{-125} \div \sqrt[3]{\frac{27}{512}}$$

$$\sqrt[3]{13 \times 13 \times 13 \times -1}$$

$$\times \sqrt{5 \times 5 \times 5 \times -1} \div \sqrt[3]{\frac{27}{512}}$$

$$(13 \times 5 \sqrt[3]{-1 \times -1}) \div \frac{3}{8}$$

$$13 \times 5 \times \frac{8}{3} = \frac{520}{3}$$

