Chapter-1

Ratio and Proportion, Indices, Logarithms

Ratio and Proportion

MTP-March '20

1. The ratio of the prices of two houses was 16: 23. Two years later when the price of the first has increased by 10% and that of the second by Rs. 477, the ratio of the prices becomes 11: 20. Find the original prices of the two houses.

   (a) Rs. 848, Rs. 1,219. (b) Rs. 838, Rs. 1,119.

   (c) Rs. 828, Rs. 1,219. (d) Rs. 848 Rs. 1,229.

2. If a: b = 3: 4, the value of (2a+3b): (3a+4b) is

   (a) 54: 25 (b) 8: 25 (c) 17: 24 (d) 18: 25

MTP-October '19

3. The ratio of the earnings of two persons 3:2. If each saves 1/5th of their earnings, the ratio of their savings.

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

4. The Third Proportional to 15 and 20 is

   (a) 80/3 (b) 80 (c) 80/7 (d) 120

5. If x+y, y+z, z+x are in the ratio 6:7:8 and x + y + z =14 then the value of x is

   (a) 6 (b) 14/3 (c) 8 (d) 10

MTP-March '19

6. The ratio compounded of 2:3, 9:4, 5:6 and 8: 10 is

   (a) 1: 1 (b) 1:5 (c) 3: 8 (d) none of these

7. The sub-triplicate ratio of 8: 27

   (a) 27: 8 (b) 24: 81 (c) 2: 3 (d) none of these

8. If $\frac{p}{q}=\frac{r}{s}=\frac{p-r}{q-s}$, the process is called

   (a) Subtrahendo (b) Componendo (c) Alternendo (d) none of these

MTP-April '19

9. If x:y:z = 2: 3:5 if x+ y+ z = 60 ,then the value of z

(a) 30 (b) 15 (c) 9 (d) 12

10. The ratio of two numbers is 15: 19. If a certain number is added to each term of the ratio it become 8 : 9. What is the number added to each of the ratio?

(a) 6 (b) 15 (c) 17 (d) 23

MTP-Oct '20

11. If $\frac{a}{3}=\frac{b}{4}=\frac{c}{5}$ then $\frac{2a+3b+2c}{4a-b+2c}$ is

(a) $\frac{11}{19}$ (b) $\frac{17}{19}$ (c) $\frac{14}{9}$ (d) $\frac{19}{7}$

12. If x: y = 2: 3, then find (5x+2y): (3x-y)

(a) 13/3 (b) 16/3 (c) 19/3 (d) 7/3

13. A bag contains ₹187 in the form 1 rupee, 50 paise and 10 paise coins in the ratio 3:4:5. Find the number of each type of coins.

(a) 102, 136, 170 (b) 136,102, 170 (c) 170, 102, 136 (d) none

14. The ratio of the speed of the two trains is 2: 5. If the distances they travel are in the ratio 5: 9, find the ratio of times taken by them.

(a) 2: 9 (b) 18: 25 (c) 25: 18 (d) 10: 45

MTP-March '21

15. Two numbers are in the ratio 7: 8 if 3 is added to each of them, their ratio becomes 8:9, the numbers are

(a) 14, 16 (b) 24, 27 (c) 21, 24 (d) 16, 18

16. Which of the numbers are not in proportions?

(a) 6,8,5,7 (b) 7.3,14,6 (c) 18,27,12,18 (d) 8,6,12, 9

MTP-March'22

17. If A: B = 2:5, then (10A + 3B): (5A + 2B) is equal to

(a) 7:4 (b) 7:3 (c) 6:5 (d) 7:9

18. The ratio compounded of 4:5 and sub-duplicate of a:9 is 8:15. Then value of "a" is

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

19. If 1/2 , 1/3 ,1/5 and 1/x are in proportion , then the value of x will be

(a) 15/2 (b) 6/5 (c) 10/3 (d) 5/6

20. Fourth proportional to x, 2x, (x+1) is:

(a) (x+2) (b) (x-2) (c) (2x+2) (d) (2x-2)

21. If $\frac{3x-2}{5x-6}$ is the duplicate ratio of $\sqrt{2/3}$ then the value of 'x ' is

(a) 2 (b) 6 (c) 5 (d) 9

MTP-Oct'21

22. If x: y = 3:5, then find $\left(\frac{1}{x}+\frac{1}{Y}\right):\left(\frac{1}{x}-\frac{1}{y}\right)$

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

23. if A: B = 3:5 and B:C= 5:4 , C:D = 2:3 and D is 50% more than E, find the ratio between A and E

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

MTP-Nov'21

24. The salaries of A, B and C are of ratio 2:3:5. if the increments of 15%, 10% and 20% are done their respective salaries, then find new salaries.

(a) 23:33:60 (b) 33:23:60 (c) 23:60:33 (d) 33:60:23

25. If A : B = 5:3, B : C = 6 : 7 and C : D = 14:9 then the value of A: B:C:D

(a) 20:14:12:9 (b) 20:9:12:14 (c) 20:9:14:12 (d) 20:12:14:9

26. The salary of P is 25% lower than that of Q and the salary of R is 20% higher than Q , the ratio of salary of R and P will be :

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

MTP-2 Nov'22

27. The ratio of two numbers are 3 : 4. The difference of their squares is 28 .Greater number is:

(a) 8 (b) 12 (c) 24 (d) 64

28. The price of scooter and moped are in the ratio 7 : 9. The price of moped is ₹ 1600 more than that of scooter. Then the price of moped is:

(a) ₹ 7200 (b) ₹ 5600 (c) ₹ 800 (d) ₹ 700

MTP-1 Nov'22

29. If $\frac{p}{q}=\frac{2}{3}$ then the value of $\frac{2p+q}{2p-q}$ is

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

30. A bag conatind 25 paise, 10 paise and 5 paise are in the ratio 3:2:1. The total value of ₹ 40, the number of 5 paise coins is

(a) 45 (b) 48 (c) 40 (d) 20

31. What must be added to each term of the ratio 49:68. So that it becomes 3:4 ?

(a) 3 (b) 5 (c) 8 (d) 9

MTP-2 June'22

32. A person has asset worth of ₹ 1,48,200. He wish to divide it amongst his wife, son and daughter in the ratio 3:2:1respectively . From this assets share of his son will be :

(a) ₹ 24,700 (b) ₹ 49, 400 (c) ₹ 74,100 (d) ₹ 37,050

33. X, Y, Z together starts a business, if X invests 3 times as much as Y invests and Y invests two third of what Z invests, then the ratio of capitals of X,Y, Z is

(a) 3:9:2 (b) 6:3:2 (c) 3:6:2 (d) 6:2:3

34. If the ratio of the roots of the equation 4x2-6x+p=0 is 1:2 then the value of p is:

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

Indices

MTP-March '20

35. $5^{16}+ 125^5$ is divisible by which of the following

(a) 5 (b) 6 (c) 8 (d) 9

MTP-October '19

36. If $2^x=3^y=6^z$ then $\frac{1}{x}+\frac{1}{y}=$

(a) $\frac{1}{z}$ (b) $\frac{1}{z}+\frac{1}{x}$ (c) $\frac{1}{z}+\frac{1}{x}$ (d) 0

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37 The value of $\left(\frac{x^a}{x^b}\right)^{(a^2+ab+b^2)} \times \left(\frac{x^b}{x^c}\right)^{(b^2+bc+c^2)} \times \left(\frac{x^c}{x^a}\right)^{(c^2+ca+a^2)}$

(a) 1 (b) 0 (c) -1 (d) none of these

38. If $x = 5^{1/3} + 5^{-1/3}$, $5x^3 -15x$ is given by

(a) 25 (b) 26 (c) 27 (d) 30

MTP April, '19

39. Simplify $\frac{2^n + 2^{n-1}}{2^{n+1} + 2^n}$ =

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

40. If. $2^a = 3^b = 12^c$ then $\frac{1}{a}+\frac{1}{b}=$

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

MTP-Oct '20

41. if $X = 3^{1/4} + 3^{-1/4}$ and $Y = 3^{1/4} - 3^{-1/4}$, then the value of $3(x^2 + y^2)^2$ will be

(a) 12 (b) 18 (c) 46 (d) 64

MTP-March '21

42. The value of $\frac{2^n+2^{n-1}}{2^{n+1}-2^n}$ is

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

43. If $3^x = 5^y = 75^z$ then

(a) x+y-z= 0 (b) $\frac{2}{x}+\frac{1}{y}=\frac{1}{z}$ (c) $\frac{1}{x}+\frac{2}{y}=\frac{1}{z}$ (d) $\frac{2}{x}+\frac{1}{z}=\frac{1}{y}$

MTP-2 Nov'22

44. Value of $\left[9^{n+\frac{1}{4}}.\frac{\sqrt{3.3^n}}{3.\sqrt{3^{-n}}}\right]^{\frac{1}{n}}$

(a) 9 (b) 27 (c) 81 (d) 3

MTP-1 Nov'22

45. $\left(\frac{\sqrt{3}}{9}\right)^{5/2}\left(\frac{9}{3\sqrt{3}}\right)^{7/2} \times 9$ is equal to

(a) 1 (b) $\sqrt{3}$ (c) $3\sqrt{3}$ (d) $\left(\frac{3}{9\sqrt{3}}\right)$

46. Find the value of $\frac{3t^{-1}}{t^{\frac{1}{3}}}$

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

MTP-2 June'22

47. If $(25)^{150} = (25x)^{50}$, then the value of x will be:

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

48. If $2^{x+y} = 2^{2x+y} = \sqrt{8}$ then the respective values of x and y are ___

(a) $0, \frac{3}{2}$ (b) ½, 1 (c) ½, ½ (d) None of these

49. If $a^2 + b^2 = 45$ and $ab = 18$, the $\frac{1}{a} + \frac{1}{b}$ is :

(a) ±1/3 (b) ±2/3 (c) ±1/2 (d) None of these

Logarithms

MTP-October '19

50. If $\log_9 X + \log_3 X = \frac{3}{2}$ then x is

(a) 0 (b) 1 (c) $\frac{9}{4}$ (d) 3

MTP-March '19

51. If $a = \log_{24} 12$, $b = \log_{36} 24$, $c = \log_{48} 36$ then prove that $1 + abc =$

(a) 2bc (b) 2ca (c) 2ba (d) 3bc

MTP-April '19

52. The value of $\log_{64} 512$ is

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

MTP-Oct '20

53. The value of $(\log_b a \log_c b \log_a c)^3 =$

(a) 1 (b) 3 (c) $(\log b\ C)^3$ (d) $(\log c\ b)^3$

54. $\log_e x + \log(1+x) = 0$ is equivalent to

(a) $x^2+x+e = 0$ (b) $x^2+x-e = 0$ (c) $x^2+x+1 = 0$ (d) $x^2+x-1 = 0$

MTP-March '21

55. If $x^2 + y^2 = 7xy$, the $\log \frac{1}{3}(x + y)$ is

(a) (logx + logy) (b) ½(logx + logy) (c) 1/3(logx+logy) (d) 3(logx/logy)

MTP-March'22

56. Find the value of $\left[\log_{10}\sqrt{25} - \log_{10}\left(2^3\right) + \log_{10}(4)^2\right]$

(a) x (b) 10 (c) 1 (d) None

MTP-Oct'21

57. Find the value of $\log \frac{x^n}{y^n} + \log \frac{y^n}{z^n} + \log \frac{z^n}{x^n}$

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

MTP-2 Nov'22

58. $\log_{0.01} 10{,}000 = ?$

(a) 2 **(b)** −2 (c) 4 (d) −4

MTP-1 Nov'22

59. $\log_a \sqrt{3} = \frac{1}{6}$, find the value of a

(a) 9 (b) 81 **(c)** 27 (d) 3

60. $\log \frac{p^2}{qr} + \log \frac{q^2}{pr} + \log \frac{r^2}{pq} =$

(a) pqr (b) $\frac{1}{pqr}$ (c) 1 **(d)** 0

ANSWER KEYS

1	(a)	2	(d)	3	(b)	4	(a)
5	(b)	6	(a)	7	(c)	8	(a)
9	(a)	10	(c)	11	(c)	12	(b)
13	(a)	14	(c)	15	(c)	16	(a)
17	(a)	18	(c)	19	(a)	20	(c)
21	(b)	22	(b)	23	(b)	24	(a)
25	(d)	26	(b)	27	(a)	28	(a)
29	(d)	30	(c)	31	(c)	32	(b)
33	(d)	34	(b)	35	(b)	36	(a)
37	(a)	38	(b)	39	(d)	40	(b)
41	(d)	42	(b)	43	(c)	44	(b)
45	(a)	46	(a)	47	(b)	48	(a)
49	(c)	50	(d)	51	(a)	52	(d)
53	(a)	54	(d)	55	(b)	56	(c)
57	(b)	58	(b)	59	(c)	60	(d)

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