VIRTUAL COACHING CLASSES
ORGANISED BY BOS (ACADEMIC), ICAI

FOUNDATION LEVEL PAPER 3:
BUSINESS MATHEMATICS LOGICAL REASONING AND STATISTICS

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PROPORTION

- It is the equality of two ratios.

- a, b, c, d are terms of a proportion if **a:b = c: d.**

- a and d are called the extreme terms and b and c are called the middle terms.

- Cross product rule is **ad = bc** i.e. product of extremes = product of means

CONTINUOUS PROPORTION

a, b, c are said to be in continuous proportion if $b^2 = ac$

'b' is called mean proportional,

'a' is called first proportional and 'c' is called third proportional

CONTINUED PROPORTION

x, y, z, w, p, q are said to be in continued proportion if

$$\frac{x}{y} = \frac{y}{z} = \frac{z}{w} = \frac{w}{p} = \frac{p}{q}$$

PROPORTION - PROPERTIES

INVERTENDO: If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{b}{a} = \dfrac{d}{c}$

ALTERNENDO: If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a}{c} = \dfrac{b}{d}$

COMPONENDO: If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a+b}{b} = \dfrac{c+d}{d}$

DIVIDENDO: If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a-b}{b} = \dfrac{c-d}{d}$

COMPONENDO & DIVIDENDO: If $\dfrac{a}{b} = \dfrac{c}{d}$ then $\dfrac{a+b}{a-b} = \dfrac{c+d}{c-d}$

ADDENDO: If $\dfrac{a}{b} = \dfrac{c}{d} = \dfrac{e}{f} = k$ say then $\dfrac{a+c+e+\cdots}{b+d+f+\ldots} = k$

PROPORTION

Example 2: Find the value of x if $10/3 : x : : 5/2 : 5/4$.

Example 3: Find the fourth proportional to $2/3, 3/7, 4$.

Example 4: Find the third proportion to 2.4 kg, 9.6 kg.

Example 5: Find the mean proportion between 1.25 and 1.8.

Example 1: If $a : b = c : d = 2.5 : 1.5$, what are the values of $ad : bc$ and $a + c : b + d$?

Example 2: If $\dfrac{a}{3} = \dfrac{b}{4} = \dfrac{c}{7}$, then prove that $\dfrac{a + b + c}{c} = 2$

PROPORTION

Example 3: A dealer mixes tea costing ₹ 6.92 per kg. with tea costing ₹ 7.77 per kg and sells the mixture at ₹ 8.80 per kg and earns a profit of $17\frac{1}{2}\%$ on his sale price. In what proportion does he mix them?

1. The fourth proportional to 4, 6, 8 is
   (a) 12   (b) 32   (c) 48   (d) none of these

2. The third proportional to 12, 18 is
   (a) 24   (b) 27   (c) 36   (d) none of these

3. The mean proportional between 25, 81 is
   (a) 40   (b) 50   (c) 45   (d) none of these

PROPORTION

6. If four numbers $1/2, 1/3, 1/5, 1/x$ are proportional then x is

(a) 6/5   (b) 5/6   (c) 15/2   (d) none of these

7. The mean proportional between $12x^2$ and $27y^2$ is

(a) 18xy   (b) 81xy   (c) 8xy   (d) none of these

(Hint: Let z be the mean proportional and $z = \sqrt{(12x^2 \times 27y^2)}$

8. If $A = B/2 = C/5$, then A : B : C is

(a) 3 : 5 : 2   (b) 2 : 5 : 3   (c) 1 : 2 : 5   (d) none of these

9. If $a/3 = b/4 = c/7$, then a + b + c/c is

(a) 1   (b) 3   (c) 2   (d) none of these

10. If $p/q = r/s = 2.5/1.5$, the value of ps : qr is

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

PROPORTION

13. If $A : B = 3 : 2$ and $B : C = 3 : 5$, then $A : B : C$ is
    (a) $9 : 6 : 10$ (b) $6 : 9 : 10$ (c) $10 : 9 : 6$ (d) none of these

14. If $x/2 = y/3 = z/7$, then the value of $(2x - 5y + 4z)/2y$ is
    (a) $6/23$ (b) $23/6$ (c) $3/2$ (d) $17/6$

15. If $x : y = 2 : 3$, $y : z = 4 : 3$ then $x : y : z$ is
    (a) $2 : 3 : 4$ (b) $4 : 3 : 2$ (c) $3 : 2 : 4$ (d) none of these

16. Division of ₹ 750 into 3 parts in the ratio $4 : 5 : 6$ is
    (a) $(200, 250, 300)$ (b) $(250, 250, 250)$ (c) $(350, 250, 150)$ (d) $8 : 12 : 9$

17. The sum of the ages of 3 persons is 150 years. 10 years ago their ages were in the ratio $7 : 8 : 9$. Their present ages are
    (a) $(45, 50, 55)$ (b) $(40, 60, 50)$ (c) $(35, 45, 70)$ (d) none of these

PROPORTION

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THANK YOU