VIRTUAL COACHING CLASSES
ORGANISED BY BOS (ACADEMIC), ICAI

FOUNDATION LEVEL PAPER 3:
BUSINESS MATHEMATICS LOGICAL REASONING AND STATISTICS

Faculty: CA RASHMI LONIKAR

RATIOS

A ratio is a comparison of sizes of two or more quantities of the same kind by division.

- Ratio of a to b = a/b or a:b

- "a" and "b" are called **terms** of the ratio and

- a is called the first term or **antecedent**

- b is called as second term or **consequent**

- Both terms of a ratio can be multiplied and divided by the same non-zero number

- The order of terms in a ratio is important 5:6 is not the same as 6:5

- Quantities to be compared should have same units

- To compare two ratios, convert them into equivalent like fractions.

- **FACTOR MULTIPLYING RATIO** : it is the ratio by which original quantity is multiplied to get new quantity.

- **GREATER INEQUALITY**   If a > b

- **LESS INEQUALITY**   If a < b

RATIOS

Consider two numbers 12 and 16

RATIOS

Illustration VI: To find which ratio is greater _____

$$2\frac{1}{3} : 3\frac{1}{3} \; ; 3.6 : 4.8$$

RATIOS

Example 1: Simplify the ratio $1/3 : 1/8 : 1/6$

RATIOS

Example 2: The ratio of the number of boys to the number of girls in a school of 720 students is 3 : 5. If 18 new girls are admitted in the school, find how many new boys may be admitted so that the ratio of the number of boys to the number of girls may change to 2 : 3.

RATIOS

- Two numbers are in the ratio 7:8. If 3 is added to each of them, the ratio becomes 8:9. The numbers are:

- 1) 14,16 2) 24, 27   3) 21,24   4) 16,18

- Two numbers are in the ratio 3:4. If we subtract 8 from each of these numbers, the ratio becomes 2:3. The numbers are

- (1) 24, 35   (2) 24,32 (3) 20, 40 (4) 56,22

- Two numbers are in the ratio 3:7. If we add 6 to each of the numbers, the ratio becomes 5:9. The numbers are

- (1) 9,21 (2) 9,18 (3) 21, 42 (4) 18, 42

RATIOS

If $\dfrac{x}{y} = \dfrac{2}{3}$ then $\dfrac{3x+5y}{5x+6y}$ = ?   Ans : ¾

- Q19/Ex 1A/1.6

> If x : y = 3 : 4, the value of $x^2y + xy^2 : x^3 + y^3$ is
> (a) 13 : 12   (b) 12 : 13   (c) 21 : 31   (d) none of these

- Ans: b

- Q22/Ex 1A/1.7

> If p : q = 2 : 3 and x : y = 4 : 5, then the value of $5px + 3qy : 10px + 4qy$ is
> (a) 71 : 82   (b) 27 : 28   (c) 17 : 28   (d) none of these

Ans: 17:28

COMPOUNDING OF RATIOS :

- When we have ratios $\frac{a}{b}$ and $\frac{c}{d}$ then compounding gives $\frac{ac}{bd}$. All antecedents are multiplied to give new antecedent and all consequents are multiplied to give new consequent

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TYPES OF RATIOS

INVERSE RATIO	If ratio is $\frac{a}{b}$, then inverse is $\frac{b}{a}$. The multiplication of ratio and its inverse is equal to one.
DUPLICATE RATIO	If ratios $\frac{a}{b}$ and $\frac{a}{b}$ are compounded, the resulting ratio is duplicate ratio. $= \frac{a^2}{b^2}$
TRIPLICATE RATIO	If three ratios $\frac{a}{b}$, $\frac{a}{b}$ and $\frac{a}{b}$ are compounded, the resulting ratio is triplicate ratio. $= \frac{a^3}{b^3}$
SUB-DUPLICATE & SUB-TRIPLICATE RATIO	Sub-duplicate ratio of $\frac{a}{b}$ is $\frac{\sqrt{a}}{\sqrt{b}}$ & sub-triplicate is $\frac{\sqrt[3]{a}}{\sqrt[3]{b}}$
CONTINUED RATIO	It is relation between three or more quantities of the same kind. Continued ratio for a, b, c is **a:b:c**

COMMENSURABLE & UNCOMENSURABLE RATIOS

When the ratio of two quantities of the same kind can be expressed as the **ratio of two integers**, the quantities are said to be commensurable .

When the ratio of two quantities of the same kind cannot be expressed as the ratio of two integers, the quantities are said to be uncommensurable . E.g. ratio of $\sqrt{3}$ and $\sqrt{5}$

Example 2 : 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 ₹ 477, the ratio of the prices becomes 11 : 20. Find the original prices of the two houses.

The sub-triplicate ratio of 8 : 27 is

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

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

3. The ratio of the quantities is 5 : 7. If the consequent of its inverse ratio is 5, the antecedent is

(a) 5   (b) $\sqrt{5}$ (c) 7   (d) none of these

The ratio compounded of 4 : 9 and the duplicate ratio of 3 : 4 is

(a) 1 : 4   (b) 1 : 3   (c) 3 : 1   (d) none of these

The ratio compounded of 4 : 9, the duplicate ratio of 3 : 4, the triplicate ratio of 2 : 3 and 9 : 7 is

(a) 2 : 7   (b) 7 : 2   (c) 2 : 21   (d) none of these

Division of ₹ 324 between X and Y is in the ratio 11 : 7. X & Y would get Rupees

(a) (204, 120)   (b) (200, 124)   (c) (180, 144)   (d) none of these

- What is the ratio between diameter of a circle and its circumference? Ans 7:22

The number which when subtracted from each of the terms of the ratio 19 : 31 reducing it to 1 : 4 is
(a) 15   (b) 5   (c) 1   (d) none of these

The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 kms. in 5 hours, the speed of the first train is
(a) 10 Km/hr   (b) 50 Km/hr   (c) 70 Km/hr   (d) none of these

14. The angles of a triangle are in ratio 2 : 7 : 11. The angles are
(a) (20°, 70°, 90°)　　　(b) (30°, 70°, 80°)　　　(c) (18°, 63°, 99°)　　　(d) none of these

16. Anand earns ₹ 80 in 7 hours and Promode ₹ 90 in 12 hours. The ratio of their earnings is
(a) 32 : 21　　　(b) 23 : 12　　　(c) 8 : 9　　　(d) none of these

17. The ratio of two numbers is 7 : 10 and their difference is 105. The numbers are
(a) (200, 305)　　　(b) (185, 290)　　　(c) (245, 350)　　　(d) none of these

18. P, Q and R are three cities. The ratio of average temperature between P and Q is 11 : 12 and that between P and R is 9 : 8. The ratio between the average temperature of Q and R is
(a) 22 : 27　　　(b) 27 : 22　　　(c) 32 : 33　　　(d) none of these

THANK YOU