Ratio & Proportion

Ratio :→ Comparison of different quantities using division

→ A = 250

B = 300

50 → common factor

$$\frac{A}{B} = \frac{250}{300} = \frac{50 \times 5}{50 \times 6} = \frac{5}{6}$$

→ A = 320 B = 480 C = 960

A : B : C = 320 : 480 : 960 = 2 : 3 : 6

C.F = 160

$$A = \frac{2}{11} \quad B = \frac{3}{11} \quad C = \frac{6}{11}$$

$\frac{A}{B} = \frac{2}{3}$ $\quad$ $\frac{B}{C} = \frac{4}{5}$

$A : B = 1 : 2$
$B : C = 3 : 4$
$C : D = 2 : 5$

→ L.C.M Method

$\frac{A}{B} = \frac{2}{3} \xrightarrow{\times 4} \frac{8}{12}$ $\quad$ $\frac{B}{C} = \frac{4}{5} \xrightarrow{\times 3} \frac{12}{15}$

$A : B : C = 8 : 12 : 15$

$1 : 2 : 2 : 2$
$3 : 3 : 4 : 4$
$2 : 2 : 2 : 5$

$6 : 12 : 16 : 40$

→ $3 : 6 : 8 : 20 = A : B : C : D$

→ Ratio Method

$A : B = 2 : 3 ; 3$
$B : C = 4 : 4 : 5$

$8 : 12 : 15$

1) $A + B = 84$

$\frac{A}{B} = \frac{3x}{4x}$ — $\times 12$ — 36 — A

$\frac{A}{B} = \frac{3x}{4x}$ — $\times 12$ — 48 — B

$3x + 4x = 84$

$7x = 84$

$\boxed{x = 12}$

2) $A : B : C = 3 : 4 : 5 = 12$

$A + B + C = 132$

12 — $\times 11$ — 132

$A = 3$ — 33

$B = 4$ — 44

$C = 5$ — 55

$A : B = 2 : 3$

$B : C = 3 : 4$

$A + B + C = 270$

$2 : 3$

$3 : 4$

$A : B : C = 2 : 3 : 4$

9 — $\times 30$ — 270

$A = 2$ — 60

$B = 3$ — 90

$C = 4$ — 120

12) $2A = 3B = 4C$

LCM = 2, 3, 4 — (12)

$A : B : C = 6 : 4 : 3$

13) $2x^2 = 6y$

$\frac{x^2}{y} = \frac{3}{1}$

15) $A \times B = 1575$

$\frac{A}{B} = \frac{9x}{7x}$ — $9x$ — 45, $7x$ — 35 ✓

$9x \times 7x = 1575$

$63x^2 = 1575$ 25

$x = 5$

17) $A : B : C = 2 : 3 : 4$

$= 2x : 3x : 4x = \boxed{16 : 24 : 32}$

$A^2 + B^2 + C^2 = 1856$

$4x^2 + 9x^2 + 16x^2 = 1856$

$29x^2 = 1856$

$x^2 = 64$

$\boxed{x = 8}$

19)

$\rightarrow A = 4\pi R^2$

$V = \frac{4}{3}\pi R^3$

$\rightarrow \frac{4\pi R_1^2}{4\pi R_2^2} = \frac{25}{36} \quad \left| \frac{R_1}{R_2} = \frac{5}{6} \right.$

$\rightarrow \frac{\frac{4}{3}\pi R_1^3}{\frac{4}{3}\pi R_2^3} = \frac{5^3}{6^3} = \frac{125}{216}$

27) $A:B:C = 3:4:5 = 3x:4x:5x$

$5x + 3x = 4x + 52$

$4x = 52$

$\boxed{x = 13}$

$\boxed{3x = 39}$

22) $\frac{A}{B} = \frac{3}{4} = \frac{3x}{4x} = \frac{18}{24}$

$\frac{3x+6}{4x+6} = \frac{4}{5}$

$15x + 30 = 16x + 24$

$\boxed{6 = x}$

25) $A + B = 62 \times 2 = 124$

$+2$

$A + B = 126$

$\frac{A}{B} = \frac{1}{2}$

3	$\times 42$	126
$A = 1$		42
$B = 2$		84

$A = 40$ $B = 84$

23) $\frac{5x - 40}{7x - 40} = \frac{17}{27}$

$135x - 1080 = 119x - 680$

$16x = 400$ $x = 25$

$7x - 5x = 2x = 50$

29) P : Q : R

2 : 5 : 7

$P+R=9$
$Q=5$) $-4 \xrightarrow{\times 200} 800$

31) ₹50 ₹20 ₹5 → Notes ×

$4x : 5x : 6x$ → Quantity

$200x : 100x : 30x$ → Amount

Amount = 3300 ₹50 Notes = ?

$200x + 100x + 30x = 3300$

$330x = 3300$

$x = 10$

₹50 = $4x$ = **40** — Ans.

33) 1₹ 0.5₹ 0.25₹

x	y	z
x	$0.5y$	$0.25z$
×4	×4	×4

$4x = 2y = 1z$ → same

$x : y : z = 1 : 2 : 4$

$x : y : z = 1 : 2 : 4$
$x + y + z = 175$

7 —×25— 175
1 —— 25×1 = 25
2 —— 50×0.5 = 25
4 —— 100×0.25 = 25

= 75 ✓

34) 21 205 2025

$$\frac{2x}{2x} \quad \frac{3x}{1.5x} \quad \frac{4}{1x} = 180$$

$$4.5x = 180$$

$$\boxed{x = 40}$$

$$2 0.5 = 3x = 120$$

36)

In (A : B : C = 3 : 7 : 4)

2400 5600 3200

Ex (A : B : C = 4 : 3 : 5)

A(In) = 2400 2100 1575 2625

A(Sa) = 300

A(Ex) = 2100

(B & C) saving = 4025 575

11, 26, 3, 6

$11-x$ $26-x$ $3-x$ $6-x$

$$\frac{10}{25} = \frac{11-x}{26-x} = \frac{3-x}{6-x} = \frac{2}{5}$$

2

5

~~3~~ 2 1 ~~4~~ ~~5~~

a b c

8, 12, 18

$$\frac{a}{b} = \frac{b}{c}$$

$a \times c = b \times b$

$8 \times 18 = 12 \times 12$

$144 = 144$ ✓

Ages

1) $\frac{A}{B} = \frac{4}{5}$

After 15 years

$\frac{A}{B} = \frac{11}{13}$

$A = 4x = \boxed{40}$

~~42~~ ~~44~~ 40 ~~50~~ 50

By Method

$\frac{4x+15}{5x+15} = \frac{11}{13}$

$52x + 195 = 55x + 165$

$30 = 3x$

$\boxed{x = 10}$

By Option

→ A चे आजचे वय 4 ने पाठ्याने आणि 15 वर्षानंतर 11 ने पाठ्याने होतो

B आजचे → 5

B 15 वर्षानंतर = 13

A + B → 9