Ratio and Propertion

Q. 145 student in A, B, C class Ratio of students in A:B is 2:3 while students in B:C is 4:3 find student in B.

→ $a : b : C = 8 : 12 : 9$

$a = \frac{8 \times 145}{29} = 40$ $\quad c = \frac{9 \times 145}{29} = 45$

$b = \frac{12}{29} \times 145 = 60$

Q. Which no. when added to 24, 32 & 42 would make in sum to be in continued propertion?

→ $\frac{24+x}{32+x} = \frac{32+x}{42+x}$

$\boxed{x = 8}$

Q. $(46-x)$ is mean of geometric progeression $(56-x)$, $(38-x)$ what is x?

→ $(46-x)^2 = (38-x)(56-x)$

$\boxed{x = 6}$

Q. $6m - n = 4m + 13n$ find value of $2m+n : 2m+3n$

→ $6m - n = 4m + 13n$

$m = 7n$

$\frac{2m+n}{2m+3n} = \frac{2 \times 7n + n}{2 \times 7n + 3n} = \frac{15}{11}$

Q. ΔABC $\angle A : \angle B = 3:2$ and $\angle B : \angle C = 4:5$ find largest ang

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

$\therefore A : B : C = 6 : 4 : 10$

$\therefore 6x + 4x + 10x = 180$

$\therefore x = 9$

$\therefore \angle C = 9 \times 10 = 90$

$\therefore A : B : C = 6 : 4 : 5$

$\therefore 6x + 4x + 5x = 180$

$\therefore x = 12$

$\therefore C = 12 \times 5 = 60°$

Q. 70cm string cut into 3:7 ratio what is longest ~~or rectangle?~~

→ $\therefore 3x + 7x = 70$ cm

$\therefore x = 7$cm

$\therefore 7x = 49$cm

Q. Cost of diamond varies according to square of we if 20 gm costs 4800 the cost of 8gm?

→

Price $\propto$ (weight)^2	$(8)^2 \times k$ = price
Price = k (weight)^2	64×12 = price
$4800 = k(20)^2$	price = 768 ₹
$12 = k$	

Q. The ratio of first to second class fares 6:4 and of pass of those class each fare is 1:30, If ₹ 2100 is colle what is amount collected from first class passenger?

→ $\frac{6}{4} \times \frac{1}{20} = \frac{6}{120} = \frac{1}{20}$

$\frac{1}{(1+20)} \times 2100 = ₹100$

₹100

Q. The ratio of salaries 4:5 if their salaries increase by 10% and 20% the ratio is:-

→ 10% and 20% rise in A and B is:

1.1 x A and 1.2 B

hence $\frac{4}{5} \Rightarrow \frac{4x}{5x} \Rightarrow \frac{1.1 \times 4x}{1.2 \times 5x} \Rightarrow \frac{44x}{60x} \Rightarrow \frac{11}{15}$

$\frac{11}{15}$

Q. $A:B:C = 3:4:7$ then $(A/B):(B/C):(C/A)$?

→ $\frac{A}{B} = \frac{3}{4}$, $\frac{B}{C} = \frac{4}{7}$, $\frac{C}{A} = \frac{7}{3}$ ∴ LCM of 3,4,7 are 84.

$(A/B):(B/C):(C/A) = \left(\frac{3}{4}\times 84\right):\left(\frac{4}{7}\times 84\right):\left(\frac{7}{3}\times 84\right)$

Ratio = 63 : 48 : 196

Q. Suresh distribute pens in 1/2, 1/4, 1/5 & 1/7 ratio to four people find total pen he initially had.

→ LCM of 2, 4, 5 & 7 is 140

∴ $A = \frac{1}{2}\times 140 = 70$

$B = \frac{1}{4}\times 140 = 35$

$C = \frac{1}{5}\times 140 = 28$

$D = \frac{1}{7}\times 140 = 20$

$A+B+C+D = 70x + 35x + 28x + 20x$

$= 153x$

Total is multiple of 153

∴ **153**

Q. If ₹ 1050 divided into three parts propertional to $(1/3):(3/4):(4/6)$ then first part?

→ LCM of 3, 4, 6 is 12 then ratioes become

$A = \frac{4}{12} = \frac{1}{3}$ $B = \frac{9}{12}$ $C = \frac{8}{12}$

First part $= \frac{4}{4+9+8}\times 1050 = \frac{4}{21}\times 1050$

First part = ~~350~~ = 200

Q. Alcohol & water 7:5 if 8 lit water added then 7:5 becomes 7:9 find alcohol in initial?

→

Alcohol = $\frac{7}{12}x$

water = $\frac{5}{12}x$ new water $\frac{5x}{12}+8$

new ratio

$$\frac{7/12\,x}{5/12\,x+8} = \frac{7}{9}$$

$x = 2$

∴ **Alcohol is $7x = 14$ litre**

Q. Annual income of A, B, C are together ₹ 4600, th 70%, 80% and 92% spends and their savings are in ratio 15:11:10 find income of A.

→

$$\frac{0.30A}{15} = \frac{0.20B}{11} = \frac{0.08C}{10}$$ Savings ratio

$$\frac{0.3A + 0.2B + 0.08C}{15+11+10} = \frac{4600}{46} = 1000$$

~~$A = 1000 \times 15$~~

$$\frac{A}{10} = \frac{B}{11} = \frac{C}{25} = \frac{A+B+C}{10+11+25} = \frac{4600}{46} = 1000$$

$A = 1000 \times 10 = 10{,}000$

$B = 1000 \times 11 = 11{,}000$

$C = 1000 \times 25 = 25{,}000$

Q. Ratio of third proportional of 12 & 30 to mean pro of 9 & 25 is

→

Third proportional ⇒ $\frac{12}{30} = \frac{30}{?}$ $? \Rightarrow 15 \times 5$

mean proportional ⇒ $\sqrt{9 \times 25} = ?$ $? \Rightarrow 15$

Ratio = 5:1

9. A, B, C to contribute in 3:4:5 they pay ₹50, ₹55, ₹75 How much amount A should pay

$55+75+50 = 180₹$

$3x+4x+5x = 180₹$

$x = 15₹$

A ⇒ 45₹

B ⇒ 60₹

C ⇒ 75₹

Q. 342 coins consist of 1₹, 0.50₹, 0.25₹ their values are in ratio 11:9:5 find no. of 50 paise coins.

→ Let no. of coins be A, B, C

$$\frac{A}{11} = \frac{B \times 0.5}{9} = \frac{C \times 0.25}{5} = \frac{A}{11} = \frac{B}{18} = \frac{C}{20}$$

$$\frac{A}{11} = \frac{B}{18} = \frac{C}{20} = \frac{A+B+C}{49} = \frac{342}{49} = 7$$

$\therefore$ **B = 18 × 7 = 112**

Q. Find compound ratio of (2:1), (3:2) & (2:5)

→ $CR = \frac{2}{1} \times \frac{3}{2} \times \frac{2}{5} = \frac{6}{5}$

Q. zinc & copper is in 9:11 ratio if zinc is 27.9 then total alloy is

→ $\frac{9}{20} \times x = 27.9$

x = 62 kg

Q. If dozen mirror dropped which cannot be ratio of broken to unbroken mirror.

→ a) 2:6 ✓c) 3:2

b) 1:2 d) 2:5

Q $x:y = 2:1$ then $(x^2+y^2):(x^2-y^2)$?

→ $\frac{x}{y} = \frac{2x}{1x}$ or $x = 2y$

$\left(\frac{4y^2+y^2}{4y^2-y^2}\right) = \frac{5y^2}{3y^2} = \frac{5}{3}$

$\boxed{\frac{5}{3}}$

Q. $x^2+4y^2 = 4xy$ then $x:y$ is

→ $x^2+4y^2-4xy = 0$

$(x-2y)^2 = 0$

$x-2y = 0$

$x = 2y$

$\boxed{\frac{x}{y} = \frac{2}{1}}$

Q. $(a+b):(b+c):(c+a) = 2:3:3$ then $a+b+c = 16$ then c ?

→ $a+b = 2$

$b+c = 3$ $\therefore a = 1, b = 1, c = 2$

$c+a = 3$

$\therefore ax+bx+cx = 16$

$\therefore x = 4$

$\boxed{\therefore c = 2\times 4 = 8}$

Q. If salaries are 4:5:6 if increaments are 20%, 25% 30% then new ratio are -

→ $\frac{A}{B} = \frac{4}{5} \Rightarrow \frac{4\times 1.2}{5\times 1.25} \Rightarrow \frac{4.8}{6.25} = 1.$

$\frac{B}{C} = \frac{5}{6} \Rightarrow \frac{5\times 1.25}{6\times 1.3} \Rightarrow \frac{6.25}{7.8}$

$4.8 : 6.25 : 7.8$

Ans → 24 : 25 : 26

9 Third proportional to (x^2-y^2) and $(x-y)$ is—

$$\frac{x^2-y^2}{x-y} = \frac{x-y}{?} \Rightarrow ? = \frac{(x-y)^2}{(x-y)(x+y)} = \frac{x-y}{x+y}$$

P. bag of 25p, 10p, 5p coins with total value ₹30 in ratio 1:2:3 then how many 5p coins are there?

→ $\frac{A}{B} = \frac{1}{2}$, $\frac{B}{C} = \frac{2}{3}$

$A = \frac{1}{2}B$, $C = \frac{3}{2}B$

~~A + B +~~ $0.25A + 0.1B + 0.05C = 30$

$$\frac{0.25 \times A}{2} + 0.1 \times B + \frac{0.05 \times 3B}{2} = 30$$

$$\frac{0.25B}{2} + \frac{0.2B}{2} + \frac{0.1B}{2} = 30$$

$$0.6B = 30 \times 2$$

$$\boxed{B = 100}$$

$C = \frac{3}{2} \times 100$,

$\boxed{C = 150}$