

Question 2

(A)

① Let the two numbers be $3x$ and $5x$, where x is the common factor.

② Subtracting 9 from each. The new numbers are
 $3x - 9$ and $5x - 9$

③ The new ratio is,

$$\frac{3x-9}{5x-9} = \frac{12}{23}$$

Cross-multiplying,

$$23(3x-9) = 12(5x-9)$$

$$69x - 207 = 60x - 108$$

$$9x = 99$$

$$x = 11$$

④ Smaller number = $3x$

$$= 3(11)$$

$$= 33$$

(B)

Investment \propto $\frac{\text{Profit}}{\text{Time}}$

Let the profit of three partners be P_1, P_2, P_3 and their respective times be T_1, T_2 and T_3 .

$$P_1 = 5, P_2 = 7, P_3 = 8$$

$$T_1 = 14, T_2 = 8, T_3 = 7$$

$$I_1 : I_2 : I_3 = \frac{P_1}{T_1} : \frac{P_2}{T_2} : \frac{P_3}{T_3}$$

$$I_1 : I_2 : I_3 = \frac{5}{14} : \frac{7}{8} : 8$$

LCM to simplify,

$$= \frac{5 \times 4}{14 \times 4} : \frac{7 \times 7}{8 \times 7} : \frac{8 \times 8}{7 \times 8}$$

$$= \frac{20}{56} : \frac{49}{56} : \frac{64}{56}$$

Ratio of Investments = 20 : 49 : 64

1	14	8	7
2	2	8	1
2	1	4	1
2	1	2	1
	1	1	1

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$$\text{Average weight of A, B, C} = \frac{A+B+C}{3} = 45$$

$$A+B+C = 45 \times 3$$

$$A+B+C = 135 \quad \text{--- (i)}$$

$$\text{Average weight of A and B} = \frac{A+B}{2} = 40$$

$$A+B = 40 \times 2$$

$$A+B = 80 \quad \text{--- (ii)}$$

$$\text{Average weight of B and C} = \frac{B+C}{2} = 43$$

$$B+C = 43 \times 2$$

$$B+C = 86 \quad \text{--- (iii)}$$

To find weight of B, subtracting (ii) from (i)

$$A+B+C = 135$$

$$-\quad A+B \quad = 80$$

$$C = 55$$

Putting value of C in (iii),

$$B + 55 = 86$$

$$B = 86 - 55$$

$$B = 31$$

Weight of B = 31

①

Let the positive no. be x ,

$$x + 17 = 60 \cdot \frac{1}{x}$$

Multiplying x on b.s

$$x(x + 17) = 60$$

$$x^2 + 17x = 60$$

$$x^2 + 17x - 60 = 0$$

Factorizing,

$$x^2 + 20x - 3x - 60 = 0$$

$$x(x + 20) - 3(x + 20) = 0$$

$$(x - 3)(x + 20) = 0$$

$$x - 3 = 0$$

$$x + 20 = 0$$

$$x = 3$$

$$x = -20$$

Choosing positive number,

$$x = 3$$

Q.3

①

Let the cost price be x .

~~The percentage pro~~

$$\frac{1920 - x}{x} \times 100 = \frac{x - 1280}{x} \times 100$$

Cancel 100 on b.s

$$\frac{1920 - x}{x} = \frac{x - 1280}{x}$$

Multiplying x on b-s

$$1920 - x = x - 1280$$

$$1920 + 1280 = x + x$$

$$3200 = 2x$$

$$\frac{2x = 3200}{2 \quad 2}$$

$$x = 1600$$

$$\text{cost price} = x = 1600$$

Selling price for 25% profit:

$$\text{Profit} = 25\% \text{ of } 1600 = \frac{25}{100} \times 1600$$

$$= 0.25 \times 1600$$

$$= 400$$

$$\text{Selling price} = \text{Cost price} + \text{Profit}$$

$$= 1600 + 400$$

$$= 2000$$

Article should be sold for Rs. 2000 to make 25% profit.

(B)

A can do work in 15 days.

$$\text{A's work in 1 day} = \frac{1}{15}$$

B can do work in 20 days.

$$\text{B's work in 1 day} = \frac{1}{20}$$

$$\text{A \& B together in 1 day} = A + B = \frac{1}{15} + \frac{1}{20}$$

$$\begin{array}{r} 5/15, 20 \\ 3/3, 4 \\ 4/1, 2 \\ \hline 111 \end{array}$$

$$A+B \text{ (1 day)} = \frac{1 \times 4}{15 \times 4} + \frac{1 \times 3}{20 \times 3}$$

$$= \frac{4}{60} + \frac{3}{60}$$

$$= \frac{4+3}{60}$$

$$= \frac{7}{60}$$

Work done by A and B in 4 days = ?

$$A+B \text{ (4 days)} = \frac{7}{60} \times 4$$

$$= \frac{7}{15}$$

Total work = 1

$$\text{Fraction of work left} = 1 - \frac{7}{15}$$

$$= \frac{15-7}{15}$$

$$= \frac{8}{15}$$

Fraction of work left is $\frac{8}{15}$ after A and B worked together for 4 days.

③

Let the person's age at present = x

Let the mother's present age = y

$$x = \frac{2}{5} y$$

After 8 years,

$$x+8 = \frac{1}{2}(y+8) \quad \text{--- ①}$$

Substituting x in ①

$$\frac{2}{5}y + 8 = \frac{1}{2}(y + 8)$$

$$2\left(\frac{2}{5}y + 8\right) = y + 8$$

$$\frac{4y}{5} + 16 = y + 8$$

$$\frac{4y}{5} - y = 8 - 16$$

$$\frac{4y - 5y}{5} = -8$$

$$4y - 5y = -40$$

$$-y = -40$$

$$y = 40$$

Substituting y in $x = \frac{2}{5}y$

$$x = \frac{2}{5} \times 40$$

$$x = 16 \quad (\text{Person's age at present})$$

Mother's age at present = $y = 40$

① Let the no. the student multiplied $\frac{5}{3}$ be x .
by mistake

$$\text{Mistaken} = x \times \frac{3}{5}, \quad \text{Correct} = x \times \frac{5}{3}$$

$$\text{Error} = \left(x \times \frac{5}{3}\right) - \left(x \times \frac{3}{5}\right)$$

$$= x \left(\frac{5}{3} - \frac{3}{5}\right)$$

$$= x \left(\frac{25 - 9}{15}\right)$$

$$\text{Error} = x \times \frac{16}{15}$$

% of Error:

$$\text{Error Percentage} = \frac{\text{Error}}{\text{Correct}} \times 100$$

$$= \frac{x \times \frac{16}{15}}{x \times \frac{5}{3}} \times 100$$

$$= \frac{16/15}{5/3} \times 100$$

$$= \frac{16 \times 3}{15 \times 5} \times 100$$

$$= \frac{16}{25} \times 100$$

$$= 64\%$$

Error Percentage in calculation is 64%.