

~ (Question No. 2) ~

Part A

Sol:-

Let the two numbers = $3x$ and $5x$

Given ratio

$3:5$

When 9 is subtracted from each
new numbers

$(3x-9)$ and $(5x-9)$

According to the question, the
new ratio is $12:23$

- Equation

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

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

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

$$69x - 60x = -108 + 209$$

$$9x = 99$$

$$x = \frac{99}{9}$$

$$x = 11$$

Smaller number = $3x$

$$= 3 \times 11 = 33$$

The smaller number is 33

Part B

Sol:-

Profit Ratio = 5:7:8

Time period for partners = 14 months,
8 months, 7 months respectively

- First partner's investment

$$5 \times 14 = 70$$

- Second partner's investment

$$7 \times 8 = 56$$

- Third partner's investment

$$8 \times 7 = 56$$

Investment Ratio = 70:56:56

By dividing each number

by 14

$$\frac{70}{14} : \frac{56}{14} : \frac{56}{14} = 5:4:4$$

So, the ratio of their investment
is 5:4:4

Part C

Sol:-

Given information

• The average weight of A, B and C is 45 kg

• The average weight of A and B is 40 kg

• The average weight of B and C is 43 kg.

Equations

$$\bullet \quad \frac{A+B+C}{3} = 45$$

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

$$= A+B+C = 135 \quad \text{--- (1)}$$

$$\bullet \quad \frac{A+B}{2} = 40$$

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

$$= A+B = 80 \quad \text{--- (2)}$$

$$\bullet \quad \frac{B+C}{2} = 43$$

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

$$= B + C = 86 \quad \text{--- (3)}$$

Equations

1. $A + B + C = 135$

2. $A + B = 80$

3. $B + C = 86$

Subtract equation 2 from equ. 1

$$(A + B + C) - (A + B) = 135 - 80$$

$$A + B + C - A - B = 55$$

$$C = 55$$

By putting value of C into
equ 3

$$B + C = 86$$

$$= B + 55 = 86$$

$$= B = 86 - 55$$

$$B = 31$$

The weight of B is 31 kg

Part - D

Sol:-

Given that

Let a number is x

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

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

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

Equation

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

Factorization

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

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

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

$$x = 3 \quad \text{or} \quad x = -20$$

The positive number is 3.

~ of Question No. 3 ~

Part A

Sol:-

Let the Cost Price = CP

The percentage of profit when
the article is sold for Rs. 1920

$$\text{Profit percentage} = \frac{\text{selling Price} - \text{Cost Price}}{\text{Cost Price}} \times 100$$

$$= \frac{1920 - CP}{CP} \times 100$$

- The percentage loss when the article is sold for Rs. 1280

$$\text{Loss percentage} = \frac{CP - SP}{CP} \times 100$$

$$= \frac{CP - 1280}{CP} \times 100$$

Given that the % profit is equal to % Loss

$$\Rightarrow \frac{1920 - CP}{CP} = \frac{CP - 1280}{CP}$$

$$\Rightarrow 1920 - CP = CP - 1280$$

$$\Rightarrow 1920 + 1280 = 2 \times CP$$

$$\Rightarrow 3200 = 2CP$$

$$\Rightarrow \frac{3200}{2} = CP$$

$$CP = 1600$$

So, CP of the article is 1600

$$\text{Profit} = 25\%$$

• 25% of 1600

$$= \frac{25}{100} \times 1600$$

$$= 400$$

Adding profit (400) to the cost Price

$$\begin{aligned} \text{Selling price} &= 1600 + 400 \\ &= 2000 \end{aligned}$$

The article should be sold for Rs. 2000 to make a 25% profit.

Part B

Sol:-

A car can do work in 15 days = $\frac{1}{15}$

B can can do work in 20 days = $\frac{1}{20}$

• When A and B work together

for 1 day

$$\text{Total work per day} = \frac{1}{15} + \frac{1}{20}$$

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

$$= \frac{1}{60}$$

$$\cdot \text{ work done in 4 days} = 4 \times \frac{1}{60}$$

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

• If the ^{total} work is 1, the fraction of work left is

$$= 1 - \frac{7}{15}$$

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

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

The fraction of work that

is left is $\frac{8}{15}$

Part C

Sol:-

• Let the present age of the person is x

• Let the present age of the mother is y

Given that

• The present age of the person is two-fifth of the mother's age

$$x = \frac{2}{5}y \quad \text{--- (1)}$$

• After 8 years, the person's age will be one-half of the mother's age

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

Equations - $\boxed{x = \frac{2}{5}y}$

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

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

$$2y + 40 = \frac{5}{2}(y + 8)$$

Multiply by 2 to eliminate fraction

$$2(2y + 40) = 2 \times \frac{5}{2}(y + 8)$$

$$4y + 80 = 5(y + 8)$$

$$4y + 80 = 5y + 40$$

$$4y - 5y = 40 - 80$$

$$-y = -40$$

$$y = 40$$

Add value of y in equ ①

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

$$x = \frac{2}{5}(40)$$

$$x = 16$$

The mother is 40 years old

Part D

Sol:-

Intended multiplication

$$\text{factor} = \frac{5}{3}$$

Incorrect multiplication factor

is $\frac{3}{5}$

Ratio of incorrect value

$$\frac{3}{5} \div \frac{5}{3}$$

$$= \frac{3}{5} \times \frac{3}{5} = \frac{9}{25}$$

Let correct value is x

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

$$\frac{5}{3} - \frac{3}{5}$$

$$= \frac{25 - 9}{15} = \frac{16}{15}$$

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

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

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

$$= \frac{48}{45} \times 100$$

$$= 64\%$$