

(Ques: 2)

(A)

(Solution)

let suppose two numbers to be = x

ratio will be $\Rightarrow \frac{3x}{5x} \rightarrow \textcircled{1}$

subtract 9 from eq $\textcircled{1}$

$$\frac{3x-9}{5x-9}$$

new ratio = $\frac{12}{23}$ so,

$$\frac{3x-9}{5x-9} = \frac{12}{23} \rightarrow \textcircled{2}$$

solve equation

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

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

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

$$9x = 99$$

$$x = \frac{99}{9} = 11$$

$$\boxed{x = 11}$$

It is smaller number.

① 12
x 9

108
23
x 3

69
② 23
x 9

207
① 12
x 5

60
207

147
108

39

---(B)---

Solution

Let three partners to be A, B, C respectively.

their shared profit = 5 : 7 : 8 respectively

Months = 14 : 8 : 7 respectively

Real ratio of investment = ?

$$\text{let ratio of A to B} = \frac{5}{7}$$

$$\text{let ratio of B to C} = \frac{7}{8}$$

$$\text{ratio of A to C} = \frac{5}{8}$$

after multiplying with
respective months equations become

$$\frac{5}{7} \times 14 = \frac{7}{8} \times 8 = \frac{5}{8} \times 7 \rightarrow \text{eq(1)}$$

solving eq(1)

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

$$10 = 7 = \frac{35}{8} \rightarrow \text{eq(2)}$$

divide and multiply '8' by eq(2)

$$80 : 56 : 35$$

so it is the ratio of their investment.

~~(C)~~

(Solution)

Average weight of A, B, C = 45 kg

Average weight of A, B = 40 kg

Average weight of B, C = 43 kg

Weight of B = ?

Average weight of A, B, C = 45 kg

$$\text{so, } \frac{A+B+C}{3} = 45 \rightarrow \textcircled{1}$$

Average weight of A, B = 40 kg

$$\text{so, } \frac{A+B}{2} = 40 \rightarrow \textcircled{2}$$

Average weight of B, C = 43 kg

$$\text{so, } \frac{B+C}{2} = 43 \rightarrow \textcircled{3}$$

$$\text{solve eq } \textcircled{1} \text{ :- } \frac{A+B+C}{3} = 45$$

$$A+B+C = 135$$

$$\begin{array}{r} \textcircled{1} 45 \\ \times 3 \\ \hline 135 \end{array}$$

solve eq (2) $\frac{A+B}{2} = 40$
 $A+B = 80$
 $B = 80 - A \rightarrow (5)$

solve eq (3) $\frac{B+C}{2} = 43$
 $B+C = 86$
 $C = 86 - B \rightarrow (6)$

put eq (5) and (6) in eq (4)

It becomes -

$$A+B+C = 135$$

$$A + 80 - A + 86 - B = 135$$

$$80 + 86 - B = 135$$

$$-B = -166 + 135$$

$$-B = -31$$

$$B = 31$$

$$\begin{array}{r} 80 \\ + 86 \\ \hline 166 \\ - 135 \\ \hline 31 \end{array}$$

So weight of B = 31 kg.

~~(D)~~

(Solution)

Find no positive = ?

Let number = x

increased by 17 so = $x + 17 \rightarrow (1)$

is equal to 60 times reciprocal

of numbers:-

reciprocal of number = $\frac{1}{x}$

60 times = $\frac{1}{x} \times 60 \rightarrow$ (2)

So equalizing eq (1) and (2):-

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

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

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

$$x^2 + 17x - 60 \rightarrow$$
 (3)

Factorizing equation (3)

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

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

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

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

$$x-3=0 \quad | \quad x+20=0$$

$$\boxed{x=3} \quad | \quad \boxed{x=-20}$$

60
^
20 3

Positive number is $\Rightarrow 3$

---(Qno:03)---

---(A)---

Solutions-

Percentage profit earned by selling an article for Rs. 1920.

Loss percentage of same article

Selling Price = Rs 1280.

What price should be sold to earn profit - 25% = ?

As,

$$\text{Profit \%} = \frac{\text{Profit} \times 100}{\text{C.P.}} \quad \text{①} \quad \text{Profit} = \text{S.P.} - \text{C.P.}$$

and

$$\text{Loss \%} = \frac{\text{Loss} \times 100}{\text{C.P.}} \quad \text{②} \quad \text{Loss} = \text{C.P.} - \text{S.P.}$$

So, by equalizing eq ① and ② we get-

$$\frac{\text{Profit} \times 100}{\text{C.P.}} = \frac{\text{Loss} \times 100}{\text{C.P.}}$$

adding profit, loss formulae-

$$\frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100 = \frac{\text{S.P.} - \text{S.P.}}{\text{C.P.}} \times 100$$

putting values of S.P of loss and profit.

$$\frac{1920 - \text{C.P.}}{\text{C.P.}} \times 100 = \frac{\text{C.P.} - 1280}{\text{C.P.}} \times 100$$

$$\frac{1920 - C.P}{C.P} \times 100 = \frac{C.P - 1280}{C.P} \times 100$$

$$1920 - C.P = C.P - 1280$$

$$-C.P - C.P = -1280 - 1920$$

$$+2C.P = +3200$$

$$C.P = \frac{3200}{2} = 1600$$

$$\begin{array}{r} 1920 \\ - 1280 \\ \hline 3200 \end{array}$$

$$\boxed{C.P = 1600}$$

Now, S.P for 25% profit
ans-

$$\text{Profit \%} = \frac{S.P - C.P}{C.P} \times 100$$

$$25 = \frac{S.P - 1600}{1600} \times 100$$

$$25 \times 16 = S.P - 1600$$

$$S.P = 400 + 1600$$

$$\boxed{S.P = 2000}$$

$$\begin{array}{r} 25 \\ \times 16 \\ \hline 150 \\ 250 \\ \hline 400 \end{array}$$

Selling Price should be
Rs. 2000 in order to get 25%.

---(C)---

---(Solution)---

Mother at present = ?

A person's present age = $\frac{2}{5}$ mother age. (1)

let person = y & mother = x ,

After 8 years = $\frac{1}{2}$ mother age. (2)

So, equalizing eq (1) & (2)

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

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

$$\frac{2}{5}y = \frac{2y}{10} + \frac{16}{5}$$

$$\frac{2y}{5} - \frac{2y}{10} = \frac{16}{5}$$

$$\frac{20y - 10y}{50} = \frac{16}{5}$$

$$\frac{10y}{50} = \frac{16}{5}$$

$$\boxed{y = 16}$$

So putting in eq (1)

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

$$16 = \frac{2}{5}x$$

$$x = \frac{80}{2} \Rightarrow \boxed{40}$$

Mother's age is 40 yrs

(D)

(Solution)

let number = x

A student multiplied it by $\frac{3}{5} = \frac{3x}{5}$

Actual multiply was by $\frac{5}{3} = \frac{5x}{3}$

Percentage error in correction = ?

$$\text{Error/difference} = \frac{5x - 3x}{3 \cdot 5} = \frac{5x - 3x}{15}$$

$$= \frac{2x}{15}$$

$$= \frac{16x}{15}$$

$$\% \text{ error} = \frac{16x \cdot 100}{15 \cdot 3}$$

$$= \frac{320x}{3}$$

$$\begin{array}{r} Q16 \\ +20 \\ 00 \\ 32x \\ \hline 320 \end{array}$$

$$\% \text{ error} = \frac{\text{error}}{\text{actual}} \times 100 \text{ so}$$

$$\% \text{ error} = \frac{16}{15} \times 100$$

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

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

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

$$= \frac{1600 \cdot 320}{25 \cdot 5} 64$$

$$\boxed{\% \text{ error} = 64.0\%}$$