

GSA - Test 4

QUESTION 2

(a)

Given:-

Amount of mixture = 60 litres

Ratio of milk and water = 2:1

To do:

Make the ratio 1:2

Quantity of water to be added = ?

Solution:-

Milk : water

2 : 1

Total parts = 3

$$\begin{aligned} \text{Share of milk} &= \frac{2}{2+1} \times 60 \\ &= 40 \end{aligned}$$

$$\begin{aligned} \text{Share of water} &= \frac{1}{2+1} \times 60 \\ &= 20 \end{aligned}$$

yl To make ratio 1:2

$$\text{Share of milk} = \frac{1}{3} \times 60$$

The amount of water needs to double to make the ratio 1:2

a The current amount of milk is 40, so its double would be 80.

By adding 60 litres more water the ratio of milk and water would then become

Milk : water

Current 40 : 20

2 : 1

By adding 60 litres of water it would become

New 40 : 20 + 60

40 : 80

1 : 2

(b)

Given:

Age of father 10 years ago was twice the age of his son

Ten years later, father's age will be twice that of his son

To do:

Ratio of present ages = ?

Solution:

To find the ratio of the ages, we need to find the current ages of both father and son.

Let x be the ^{current} age of father

Let y be the ^{current} age of son.

Condition 1

$$x - 10 = 3y \rightarrow \textcircled{1}$$

Condition 2

$$x + 10 = 2y \rightarrow (2)$$

By subtracting eq (1) and (2)

$$x - 10 = 3y$$

$$x + 10 = 2y$$

$$-20 = y$$

$$y = -20$$

Putting value of y in eq (1)

$$x - 10 = 3y$$

$$x - 10 = 3(-20)$$

$$x - 10 = -60$$

$$-10 + 60 =$$

$$x = -60 + 10$$

$$x = -50$$

Ratio of current ages

Son: Father

$$+20 : +50$$

$$2 : 5$$

(c)

Given:

Rehman went 15 km to north,
then 10 km to his left,
again 5 km to his left
again 10 km to his left

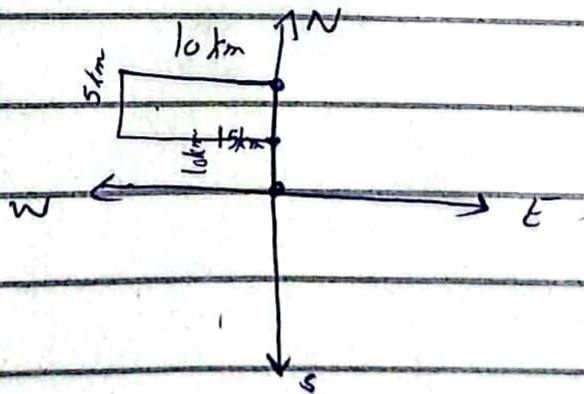
To do:

Direction from his house = ?

Distance from his house = ?

Total distance travelled = ?

Solution:



① Rehman is in north to his house

(2) Distance from his house
 $15 - 5 = 10 \text{ km}$

(3) Total distance travelled
 $15 + 10 + 5 + 10$
 $= 40 \text{ km}$

(d)

Given:

Ratio between speeds of two
trains = $7:8$

Second train travels 400 km
in 4 hours .

To do:

Speed of first train = ?

Solution:

Let v_1 be the speed of
train one

Let v_2 be speed of second
train

$$V_1 : V_2$$

$$7 : 8$$

let d_1 be the distance travelled by
Train one

let d_2 be the distance travelled
by second train

Distance d_2 by second train = 400 km
 $t_2 = 4$ hours

Speed of train two = $\frac{\text{distance}_2}{\text{time}_2}$

$$= \frac{400}{4}$$

$$V_2 = 100 \text{ km/h}$$

QUESTION 3

(a)

Given:

Three partners share profit with ratio

5: 7: 8

Partnered for 14 months, 8 months
and 7 months

To do:

Ratio of the investments: ?

Solution:

Partnered for 14, 8, 7 months
respectively.

Ratio of investment

(b)

Given:-

Average of 3 consecutive odd

numbers = 91

To do:

Find numbers = ?

Solution:

Let x_1, x_2, x_3 be the nos

as they are so, it would

be

$x_1, x_2 + 2, x_3 + 4$

Given Average of 3 odd

numbers = 91

$$x_1 + x_2 + 2 + x_3 + 4 = 91$$

$$3x + 6 = 91$$

$$3x = 91 - 6$$

$$3x = 85$$

$$x = \frac{85}{3} = 28.3 \text{ closer to } 29$$

So the numbers are 29, 29+2, 29.

29, 31, 33

(c)

Given:

40% of a number equals $\frac{2}{3}$ of another number.

To do:

Ratio of first number to
Second number = ?

Solution:

Let x be first number

Let y be the second number

$$40\% \text{ of } x = \frac{2}{3} \text{ of } y$$

$$\frac{40}{100} x = \frac{2}{3} y$$

$$\frac{2}{5} x = \frac{2}{3} y$$

By cross multiplying we will get

$$3 \cdot 2x = 10y$$

$$3x = 5y$$

$$\frac{3}{5} = \frac{y}{x} \quad \frac{x}{y} = \frac{5}{3}$$

Ratio of first number to
second is $\boxed{5:3}$

(d)

Given:

Source of light at a distance
of 4 meters from tree

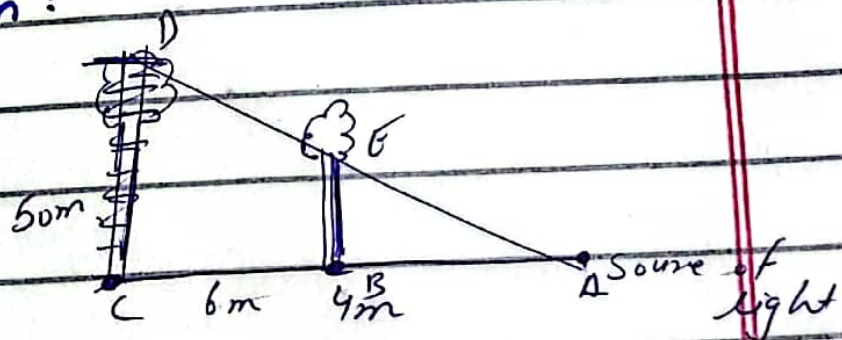
Shadow of tree on building = 50 m

Tree is away from tree = 6 m

To do:

Height of tree = ?

Solution:



$$AB = 4m$$

$$BC = 6m$$

$$DC = 50m$$

$$BE = ?$$

Using the trig theory of

concurrent triangles and their sides
being equal we get

$$\frac{AC}{AB} = \frac{CD}{BF}$$

$$\frac{10}{4} = \frac{50}{x}$$

$$x = \frac{50 \times 4}{10}$$

$$x = 20$$

The height of tree is 20m