

GSA Test 4.

Zarghuna

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Question #2.

Asked: Quantity of water to be added.

Given: Ratio of milk to water = 2:1 ✓

If new ratio is 1:2

Total mixture = 60 l.

then let x be the total amount of mixture and y be the amount of water to be added.

Solution

$$2x + x = 60$$

$$3x = 60$$

$$x = 20$$

The mixture was in ratio $2(20) : 1(20) = 40 : 20$.

After adding y liters of water the ratio becomes

$$40 : (20 + y) = 1 : 2$$

$$\frac{40}{20 + y} = \frac{1}{2}$$

$$80 = 20 + y$$

$$y = 80 - 20$$

$$y = 60$$

Total volume of water becomes = $60 + 20 = 80$.

Thus new ratio is $40 : 80 = 1 : 2$.

Therefore further amount of water added was 60 l to make ratio 1:2.

b. Given: Age of father after 10 years will be twice age of son.

Age of father 10 years ago was thrice the age of his son.

Asked: The ratio of present ages.

Solution let father present age be x .

let son's present age be y .

	Present age	Past age	Future age
Father	x	$x-10$	$x+10$
Son	y	$y-10$	$y+10$

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

$$x-10 = 3y-30$$

$$x = 3y - 30 + 10$$

$$x = 3y - 20 \rightarrow (1)$$

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

$$x = 2y + 20 - 10$$

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

Equating both equations to one another

$$2y + 10 = 3y - 20$$

$$10 + 20 = 3y - 2y$$

$$y = 30$$

Putting $y = 30$ in equation (2).

$$x = 2(30) + 10$$

$$x = 60 + 10$$

$$x = 70$$

Ratio of Father to Son = 70:30

14:6

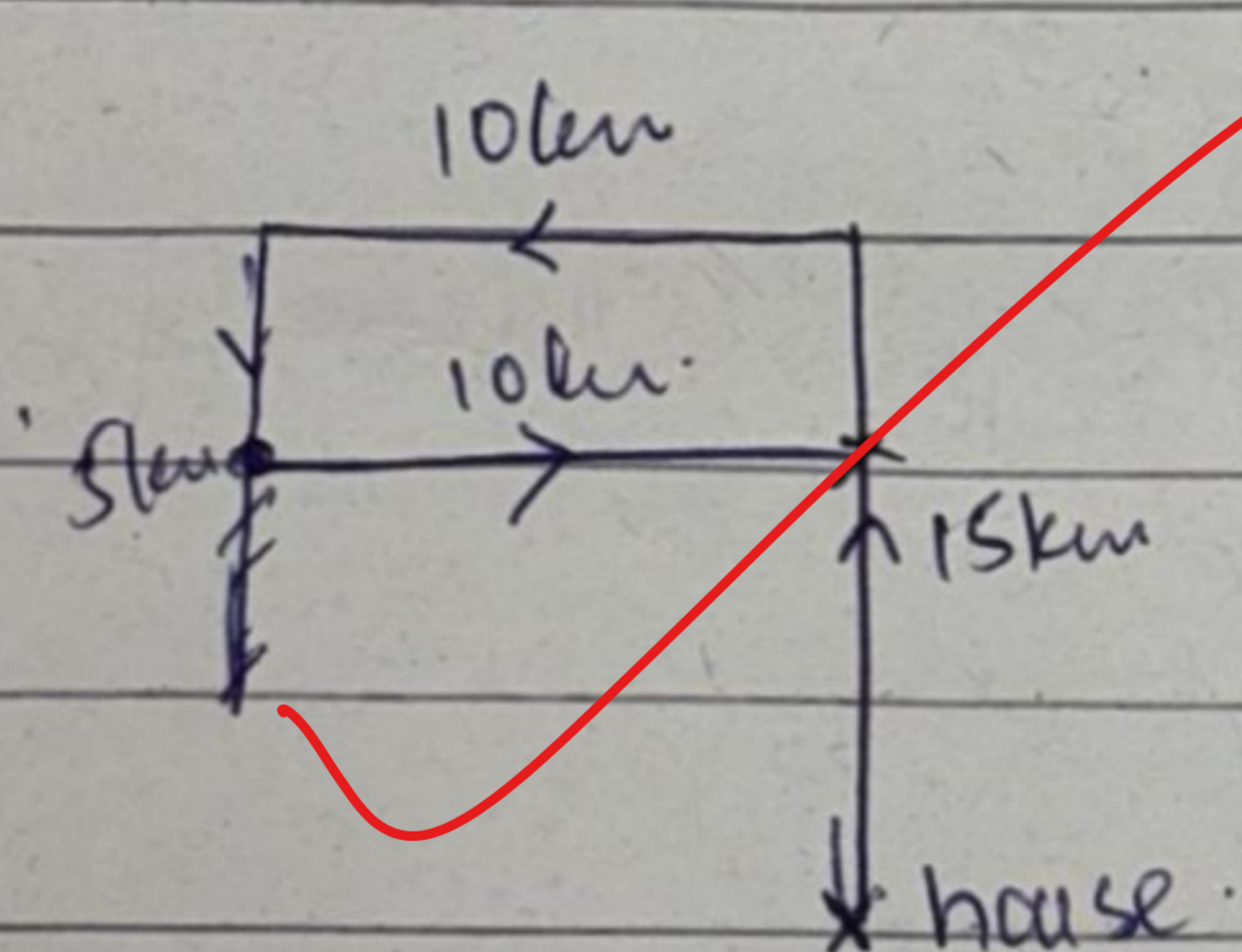
7:3

Conclusion: Father: Son = 7:3

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- c) Given: Rehman walks 15km to North
Then turns left and walks 10km
Then again turns left and covers 5km.
Finally turning left he walks 10km.

Diagram:



Asked:

1. Which direction he is from home?

He is towards North from his house.

2. How far he is from home?

He is $15 - 5 = 10$ km away from home.

3. How much distance he covered?

$$\begin{aligned} \text{Total distance} &= 15 + 10 + 5 + 10 \\ &= 40 \text{ km} \end{aligned}$$

D. Given: Ratio between speeds of trains = 7:8
Second train runs 400 km in 4 hours

Asked: Speed of train 1?

Solution:

Formula of Speed

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$7 + 8 = 15$$

Speed of Train 2.

$$\text{Speed} = \frac{400}{4} = 100 \text{ km h}^{-1}$$

Let x be the ~~total~~ speed of ~~both~~ trains.

$$\frac{8x}{15} = 100$$

$$x = \frac{100 \times 15}{8}$$

$$x = 150 \text{ km h}^{-1}$$

$$\text{Speed of Train 1} = \frac{7(150)}{15} = 70 \text{ km h}^{-1}$$

$$\text{Speed of Train 1} = 50 \text{ km h}^{-1}$$

$$\begin{array}{r} 150 \\ 70 \\ \hline 220 \end{array}$$

$$\begin{array}{r} 10 \\ 15 \overline{)150} \\ \underline{15} \\ 0 \end{array}$$

Question 3

a) Given: Ratio of profit = 5:7:8
Time of partnership = 14 months, 8 months
and 7 months

Asked: Ratio of their investments

Solution:

Formula for profit

$$\text{Profit} = \text{Investment} \times \text{time}.$$

$$5 \times 14 : 7 \times 8 : 8 \times 7$$

$$70 : 56 : 49$$

$$35 : 28 : 24.5$$

b) Given: Average of 3 consecutive odd numbers = 91.
Asked: Find numbers.

Solution

Let 1st odd number = x .

2nd odd number = $x+2$.

3rd odd number = $x+4$.

Sum of 3 consecutive odd numbers = ~~91~~

$$x + x + 2 + x + 4 = \del{91}$$

$$3x + 6$$

Formula of Average.

$$\text{Average} = \frac{\text{Sum of numbers}}{\text{Total number of numbers}}$$

$$91 = \frac{3x + 6}{3}$$

$$\frac{3x + 6}{3} = 91.$$

$$\frac{3(x + 2)}{3} = 91.$$

$$x + 2 = 91.$$

$$x = 91 - 2.$$

$$x = 89.$$

Conclusion:

1st odd number = 89.

$$2\text{nd odd number} = 91$$

$$3\text{rd odd number} = 93$$

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c) Given: If 40% of number equal to two-third of another number

Asked: Ratio of 1st number to second

Solution: let unknown number = x and y .

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

$$\frac{240}{5 \times 100} x = \frac{2}{3} y$$

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

$$6x = 10y$$

$$\frac{x}{y} = \frac{10}{6} = \frac{5}{3}$$

\therefore ratio of 1st number x to 2nd number y is $5:3$.

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d) Given: Distance between source of light and tree = 4 m.

height of building = 50 m

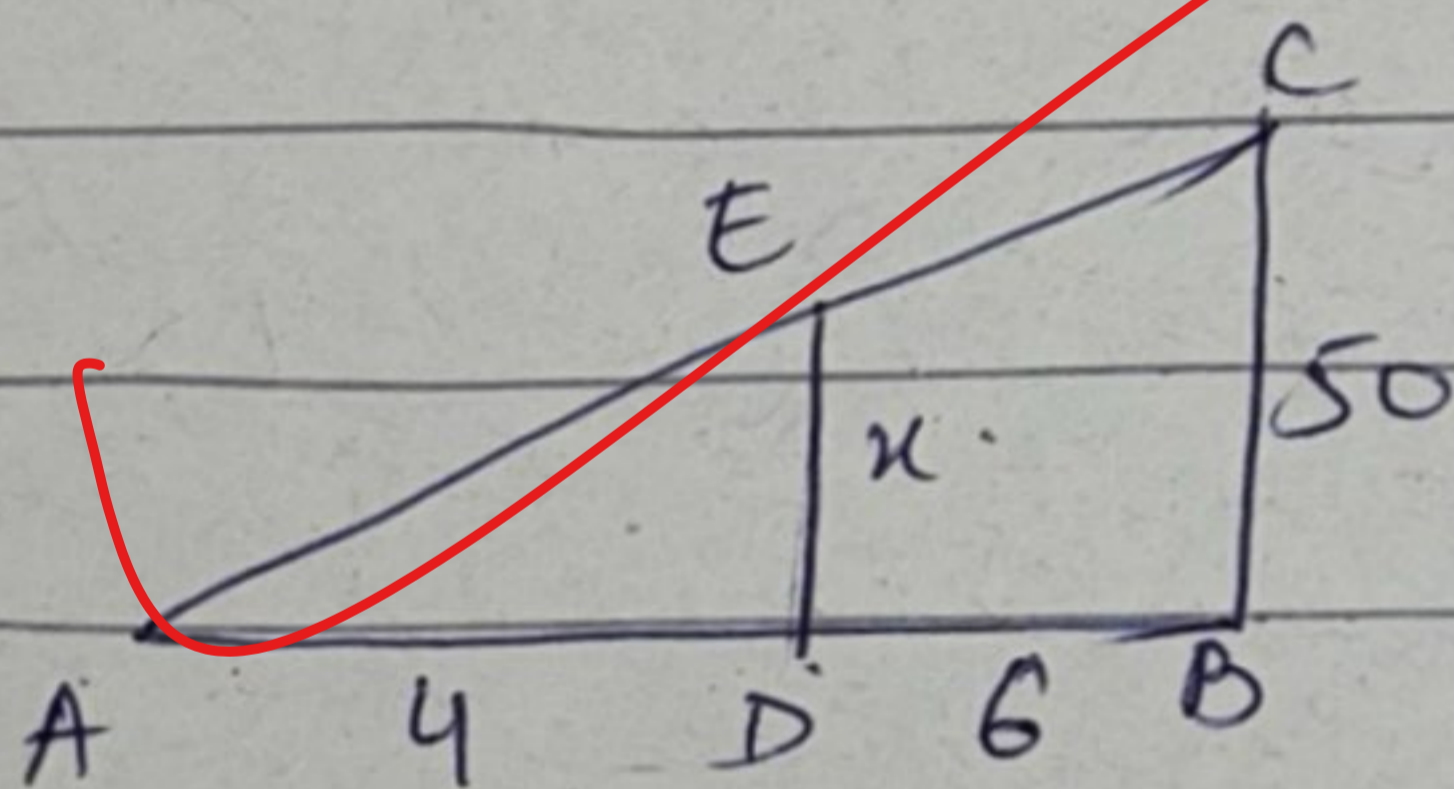
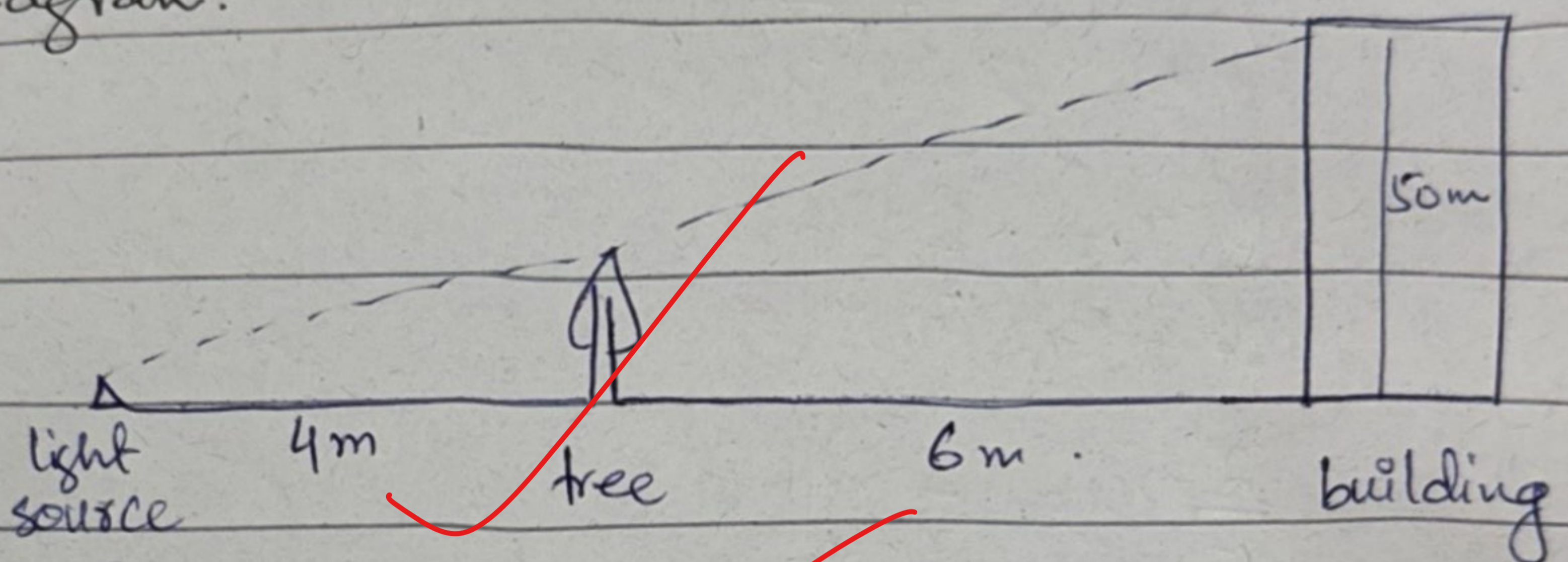
Distance between tree and building = 6 m

Asked Height of tree = ?

Solution:

let height of tree = x

Diagram.



Using similarity of triangles. ABC and ADE

$$\frac{4}{4+6} = \frac{x}{50}$$

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

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

$$x = 20$$

Hence height of tree = 20 m.