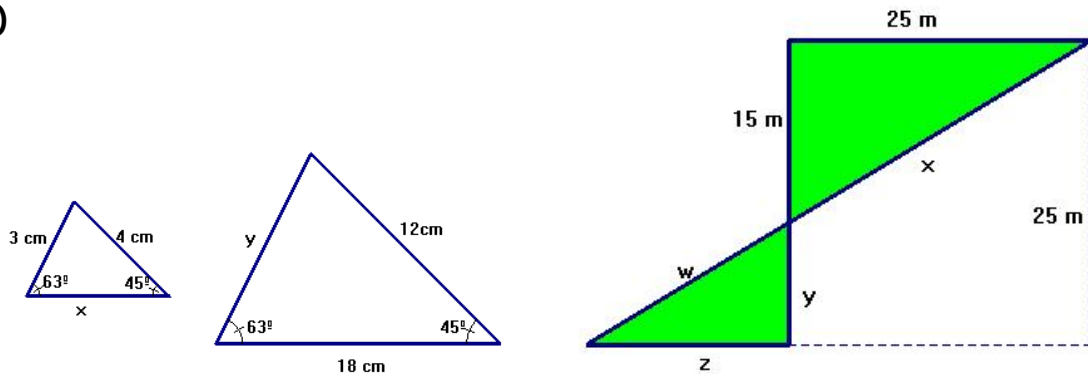


### SIMILARITY

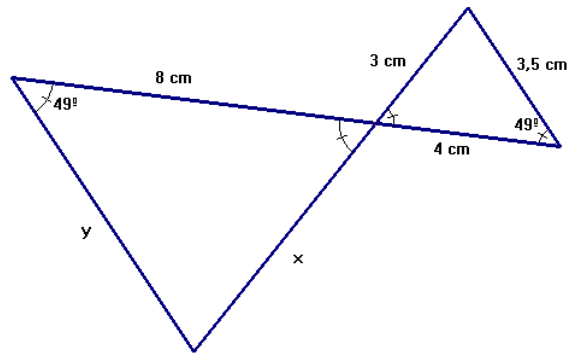
1. Use similar triangles to find the sides marked with letters.

a)

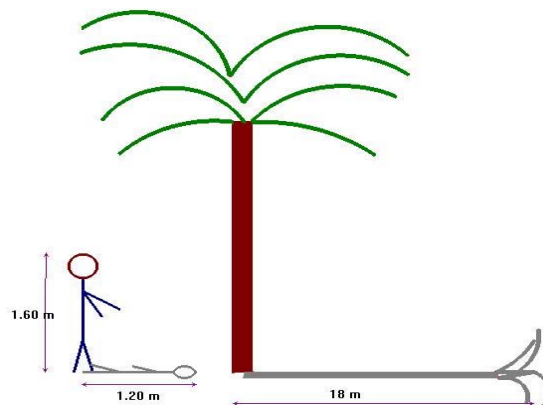
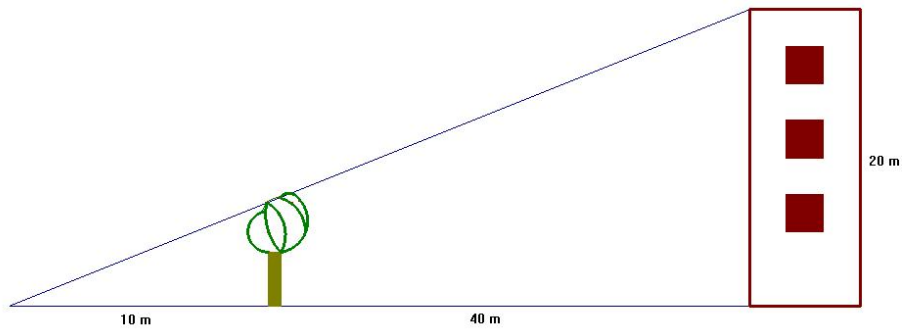


b)

2. Calculate the lengths of  $x$  and  $y$  in the diagram shown:



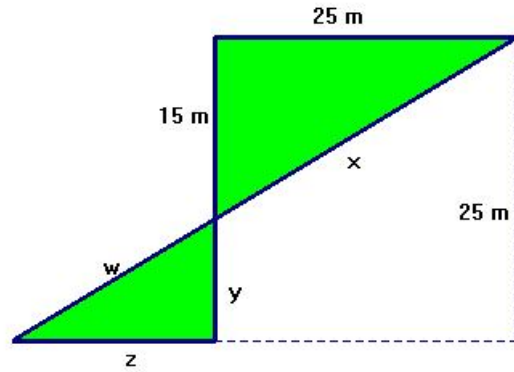
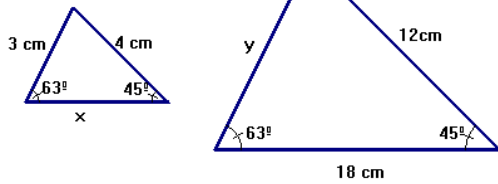
3. Find the height of the trees.



**SOLUTION**

1. Use similar triangles to find the sides marked with letters.

a)



b)

a)

$$\frac{12}{4} = \frac{18}{x} \rightarrow x = 6 \text{ cm}; \quad \frac{12}{4} = \frac{y}{3} \rightarrow y = 9 \text{ cm}$$

b)

$$y = 25 - 15 = 10 \text{ m} \quad \frac{x}{w} = \frac{15}{10} = \frac{25}{z}$$

$$z = \frac{250}{15} = 16.67 \text{ m}; \quad x^2 = 15^2 + 25^2$$

$$x = \sqrt{850} = 29.15 \text{ m}$$

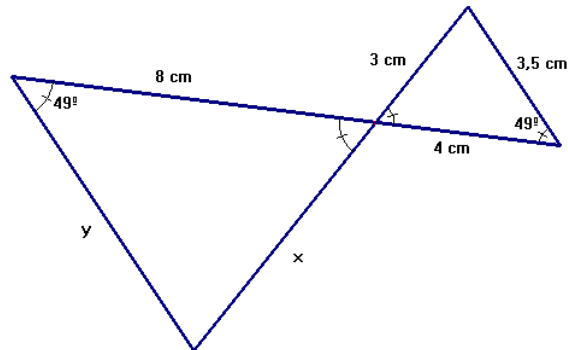
$$\frac{29.15}{w} = \frac{15}{10} \Rightarrow 291.5 = 15w \Rightarrow w = 19.44 \text{ m}$$

2. Calculate the lengths of x and y in the diagram shown:

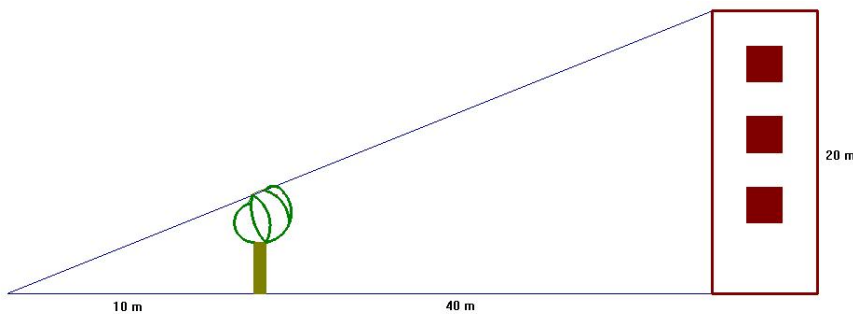
$$\frac{8}{4} = \frac{x}{3} = \frac{y}{3.5}$$

$$\frac{8}{4} = \frac{x}{3} \Rightarrow x = \frac{24}{4} = 6 \text{ cm}$$

$$\frac{8}{4} = \frac{y}{3.5} \Rightarrow y = \frac{28}{4} = 7 \text{ cm}$$



3. Find the height of the trees.



$$\frac{x}{20} = \frac{10}{50}$$

$$x = \frac{200}{50} = 4 \text{ m}$$

The height of the tree is 4 m

$$\frac{x}{1.60} = \frac{18}{1.20}$$

$$x = \frac{18 \cdot 1.60}{1.20} = 24 \text{ m}$$

The palm tree is 24 m tall

