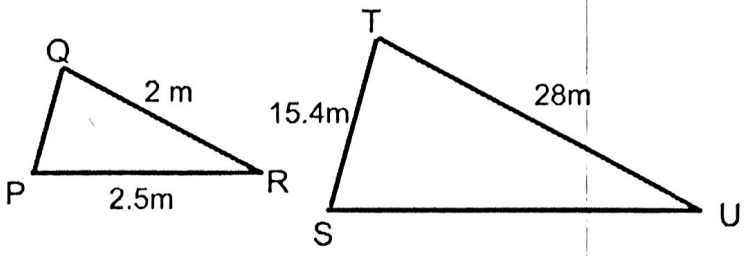
Similar Triangles Extended Warmup | MPM2D

1) Find the lengths of each unknown side in the following pair of similar triangles, by finding the scale factor first.

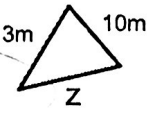


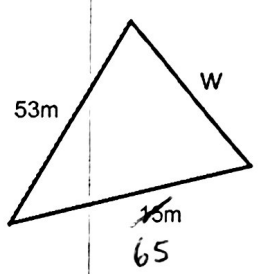
$k = 28/2 = 14$

$SU = 2.5 \times 14 = 35m$

$PQ = 15.4 \div 14 = 1.1m$

2) Find the lengths of each unknown side in the following pair of similar triangles by setting up a proportion.





$\frac{\text{Big}}{\text{Small}} \quad \frac{53}{13} = \frac{65}{z}$

$z = 13 \times 65 \div 53 = 15.94m$

$\frac{\text{Big}}{\text{Small}} \quad \frac{53}{13} = \frac{w}{10}$

$w = 53 \times 10 \div 13 = 40.77m$

3) The areas of two similar triangles are 146.25cm^2 and 60cm^2. What is the ratio of their corresponding side lengths (i.e. what is the scale factor)?

$\frac{A_{big}}{A_{small}} = k^2$

$\frac{146.25}{60} = k^2$

$2.4375 = k^2$

Scale Factor

$k = \sqrt{2.4375}$

$k \doteq 1.56$

Big sides are 1.56 times the small sides

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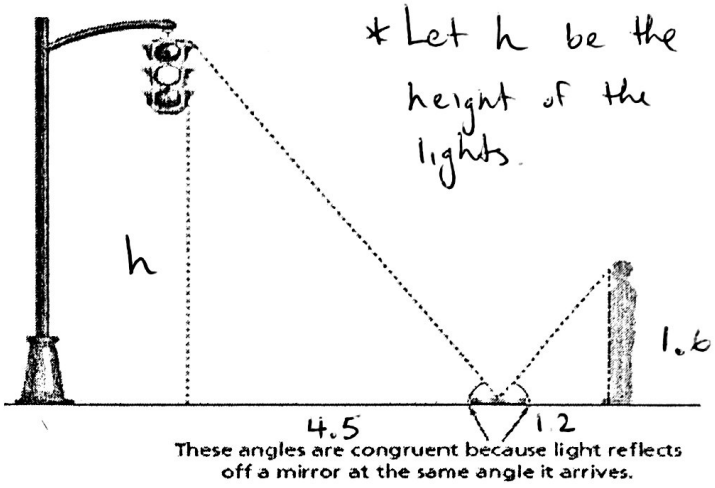
4) One method of measuring inaccessible heights is by using a mirror on horizontal ground.

Because the angle of incidence is the same as the angle of reflection, this forms a pair of similar triangles.

If the person in the diagram has their eyes 1.6m above the ground, places the mirror 4.5m away from lights, and sees the lights when they are 1.2m from the mirror, how tall are the lights?



* Let h be the height of the lights.

$$\frac{4.5}{1.2} = \frac{h}{1.6}$$

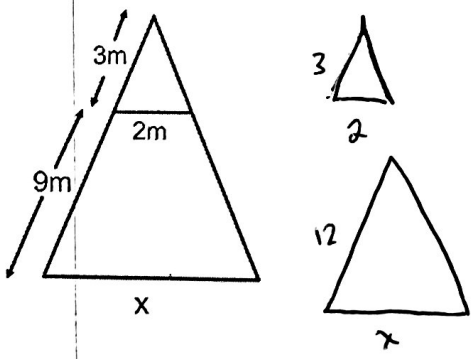
$h = 1.6 \times 4.5 \div 1.2$

$h = 6\text{m}$

The lights are 6m tall.

5) Determine the measure of "x" in the following diagrams.

a)

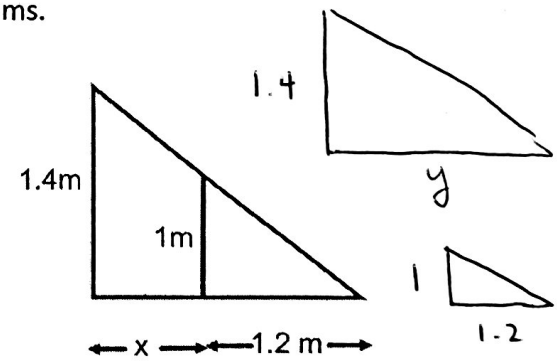


$$\frac{12}{3} = \frac{x}{2}$$

$x = 12 \times 2 \div 3$

$x = 8\text{m}$

b)



$$\frac{1.4}{1} = y/1.2$$

$y = 1.4 \times 1.2 \div 1$

$y = 1.68$

$x = 1.68 - 1.2$

$x = 0.48\text{m}$