INDIRECT MEASUREMENT PROBLEMS Name _____

Hour _____

The principal asked Hank to demonstrate what he was learning in math class. Hank decided to use the mirror method to estimate the principal's height. Here are the measurements Hank recorded. Use them to find the principal's height.

We know we have AA similarity

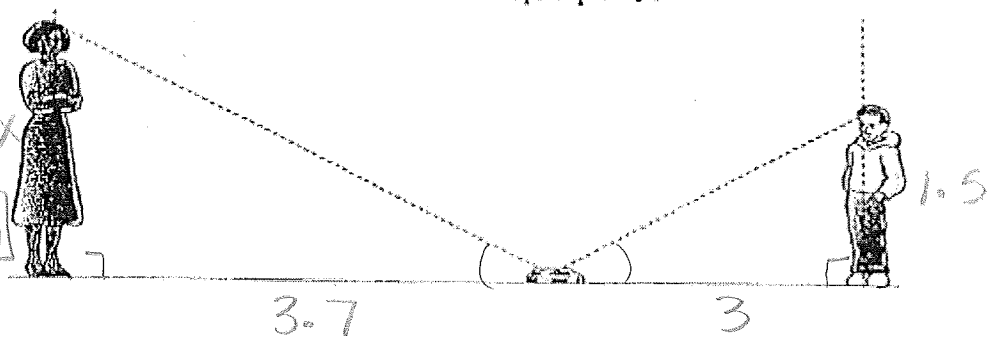
∴ Δs are similar

$\frac{x}{1.5} = \frac{3.7}{3}$

$3x =$

$x = 1.85$ m

Height from the ground to Hank's eyes = 1.5 m
Distance from the center of the mirror to Hank = 3 m
Distance from the center of the mirror to the principal = 3.7 m



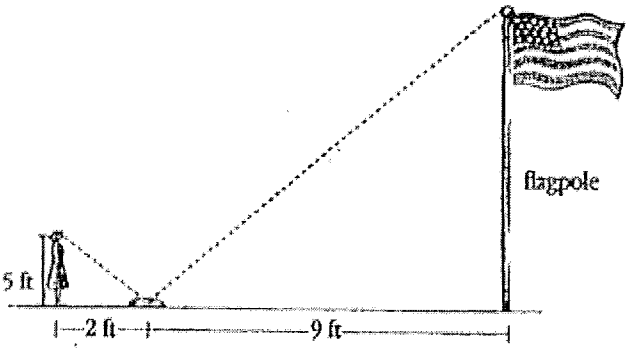
Joan used a mirror to estimate the height of a flagpole. Below are the measurements she recorded. What is the height of the flagpole?

AA similarity

$\frac{x}{5} = \frac{9}{2}$

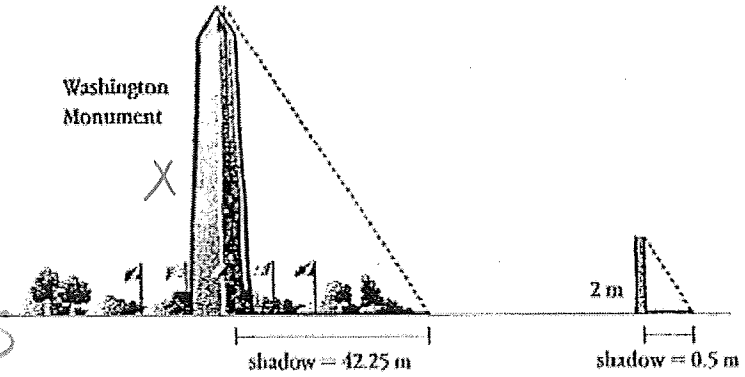
$x = 22.5$ ft

Height from the ground to Joan's eyes = 5 feet
Distance from the center of the mirror to Joan = 2 feet
Distance from the center of the mirror to the flagpole = 9 feet



A stick 2 meters long casts a shadow 0.5 meters long. At the same time, the Washington Monument casts a shadow 42.25 meters long. How tall is the Washington Monument?

AA similarity



$\frac{X}{2} = \frac{42.25}{0.5}$

$0.5X = 84.5$

$X = 169$ m

Show all work. Romeo is trying to see his Juliet but the only way to do so is to climb through her window. Her window is 14 feet off the ground. He knows his 10 foot ladder is too short because it only reaches up 8 feet. He has an idea to use his 18 foot ladder, but he is unsure if the ladder will reach. Use the following information to help Romeo see his love:
The two ladders are leaning against a wall such that they make the same angle with the ground. The 10 foot ladder reaches 8 feet up the wall.

How high does the 18 foot ladder reach? 14.4 ft

How much further does the 18 foot ladder reach? 6.4 ft

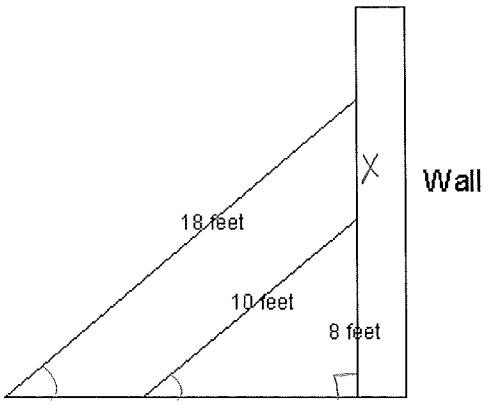
If Romeo can climb through Juliet's window, illustrate this in the picture.

$\frac{18}{10} = \frac{8+x}{8}$

$144 = 80 + 10x$

$64 = 10x$

$6.4 = x$



$8 + 6.4 = 14.4$ ft