Questions on Lesson 4.5?

We'll go over any questions you have after attendance is taken, so get out your book and look at lesson 4.5 to go over what we learned last class.

Feb 27-8:47 AM

4.6 Indirect Measurement
Application of Similar Triangles

PG.318 IN YOUR BOOK

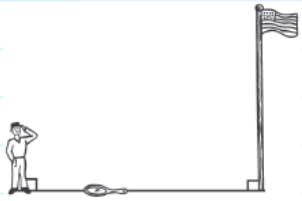
At times, measuring something directly is impossible, or physically undesirable. When these situations arise, **indirect measurement**, the technique that uses proportions to calculate measurement, can be implemented. Your knowledge of similar triangles can be very helpful in these situations.

Use the following steps to measure the height of the school flagpole or any other tall object outside. You will need a partner, a tape measure, a marker, and a flat mirror.

Step 1: Use a marker to create a dot near the center of the mirror.

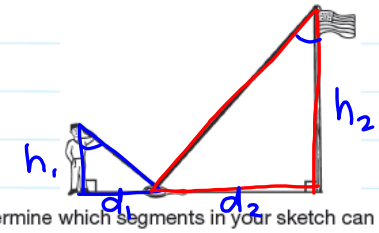
Step 2: Face the object you would like to measure and place the mirror between yourself and the object. You, the object, and the mirror should be collinear.

Step 3: Focus your eyes on the dot on the mirror and walk backward until you can see the top of the object on the dot, as shown.



Step 4: Ask your partner to sketch a picture of you, the mirror, and the object.

Step 5: Review the sketch with your partner. Decide where to place right angles, and where to locate the sides of the two triangles.



Step 6: Determine which segments in your sketch can easily be measured using the tape measure. Describe their locations and record the measurements on your sketch.

p319

① AA ~ so we can use a proportion to find the height of the flagpole.

② $\frac{h_2}{h_1} = \frac{d_2}{d_1}$

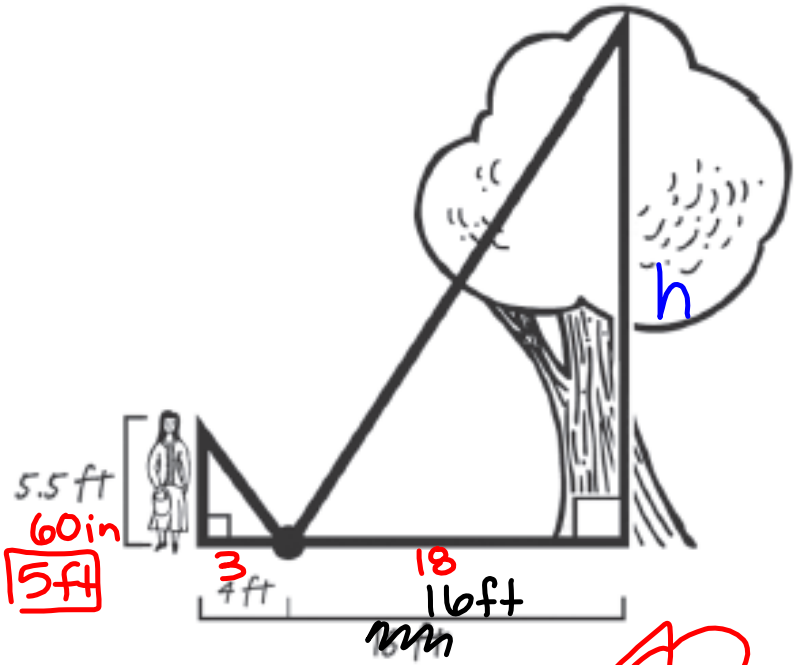
SKIP 3 & 5
ANSWER 4

④ Set up proportion wrong, measurements could be off, using hypotenuse when it's not asked for.

Sep 14-9:16 AM

PG.320 IN YOUR BOOK

1. You go to the park and use the mirror method to gather enough information to calculate the height of one of the trees. The figure shows your measurements. Calculate the height of the tree.



$$\frac{5.5}{4} = \frac{h}{16}$$

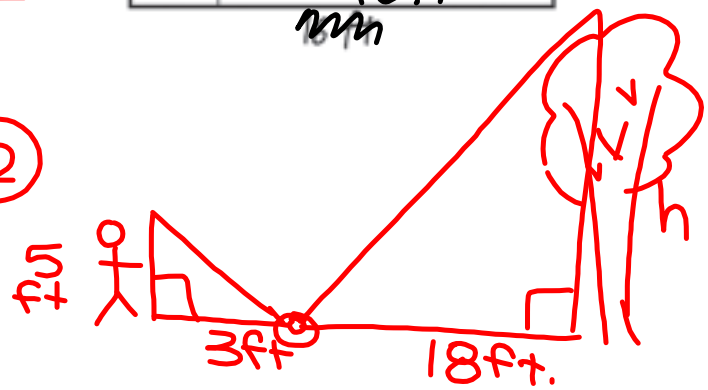
OR

$$\frac{h}{5.5} = \frac{16}{4}$$

$$\frac{4h}{4} = \frac{88}{4}$$

$h = 22\text{ft}$

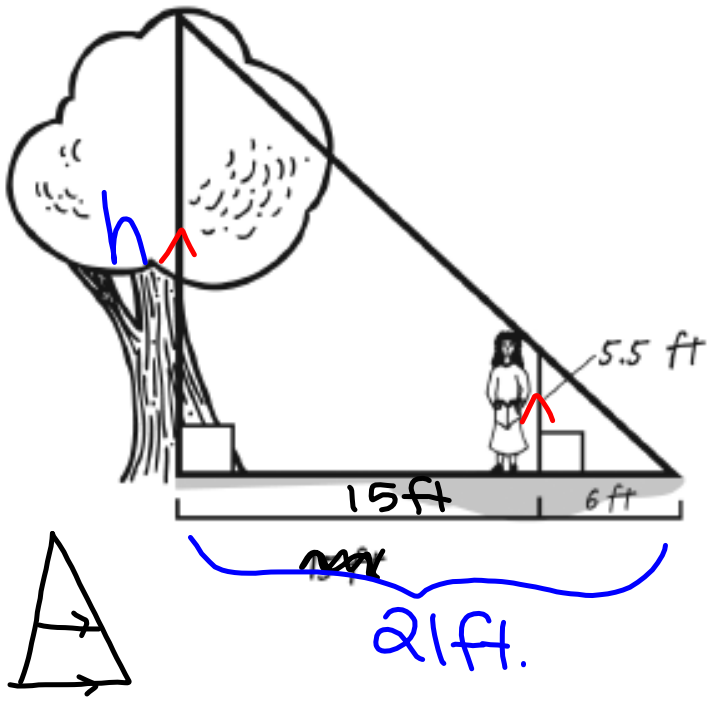
(2)



$h = 30\text{ft.}$

PG.321 IN YOUR BOOK

3. Stacey notices that another tree casts a shadow and suggests that you could also use shadows to calculate the height of the tree. She lines herself up with the tree's shadow so that the tip of her shadow and the tip of the tree's shadow meet. She then asks you to measure the distance from the tip of the shadows to her, and then measure the distance from her to the tree. Finally, you draw a diagram of this situation as shown below. Calculate the height of the tree. Explain your reasoning.



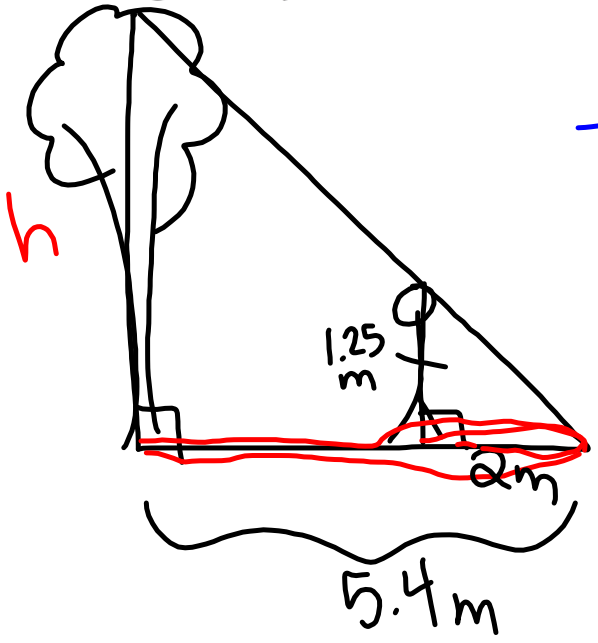
$\frac{h}{5.5} = \frac{21}{6}$

$\frac{6h}{6} = \frac{115.5}{6}$

$h = 19.25$

NOT IN YOUR BOOK

1. You want to measure the height of a tree at the community park. You stand in the tree's shadow so that the tip of your shadow meets the tip of the tree's shadow on the ground, 2 meters from where you are standing. The distance from the tree to the tip of the tree's shadow is 5.4 meters. You are 1.25 meters tall. Draw a diagram to represent the situation. Then, determine the height of the tree.



$\frac{h}{1.25} = \frac{5.4}{2}$

OR

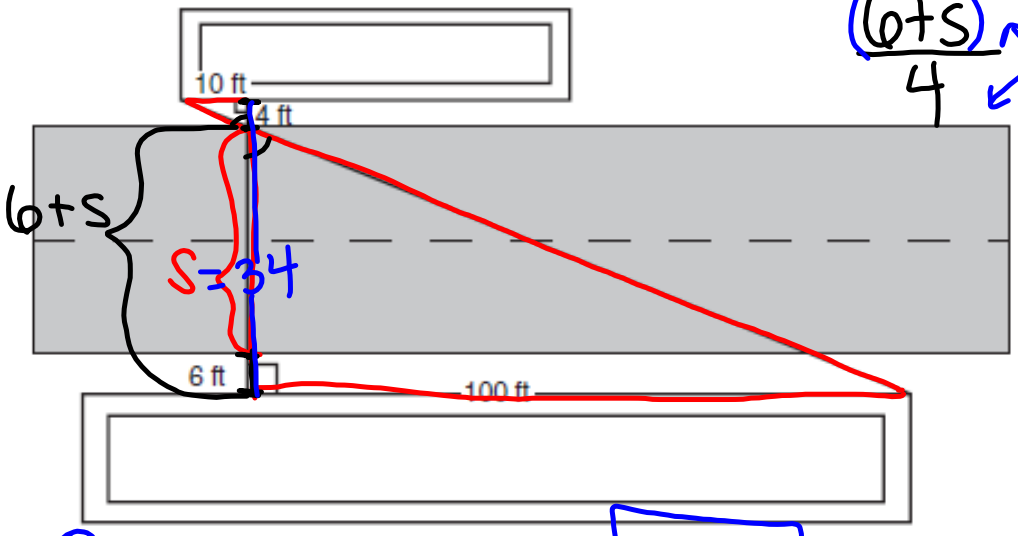
$\frac{5.4}{h} = \frac{2}{1.25}$

$\frac{2}{2}h = \frac{6.75}{2}$

$h = 3.375$ m

NOT IN YOUR BOOK

You and a friend are on the 10th floor of apartment buildings that are directly across the street from each other, and have balconies. The two of you are making a banner to hang between the apartment buildings. The banner must cross the street. To hang the banner, you and your friend need to attach it to hooks on the wall of each balcony. The wall of your balcony is 6 feet away from the street and the wall of your friend's balcony is 4 feet away from the street. You also know that your friend's balcony is 10 feet away from the end of his building and your balcony is 100 feet away from the edge of your building. How wide is the street between you and your friend's apartment buildings? How long does the banner need to be? Show all your work and use complete sentences in your answer.



$\frac{6+s}{4} = \frac{100}{10}$

$400 = 10(6+s)$

$400 = 60+10s$

$-60 \quad -60$

$\frac{340}{10} = \frac{10s}{10}$

street distance: $34 = S$ ft

Banner: $6+4+34 = 44$ ft

Homework

Finish 4.6

Aug 24-2:00 PM