

4-5 Indirect Measurement  
pgs. 318 - 324

Materials needed: Must bring book pages to class, tape measure, a marker, a pocket mirror, paper and pencil (to record data).

pg. 318

**Indirect Measurement:** The technique that uses proportions to calculate measurement.

Assign each of the following roles to one member of your group  
(groups of 3)

1. Person who will "sight" the object in the mirror and be measured ("sighter")
2. Person who will do the measuring
3. Person who will record the data

**\*\*Note:** For the following task: Students' eye sight should be parallel to the ground as your partner measures your eye level height (not looking at the mirror).

pg. 318-319

## Outside Task

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.

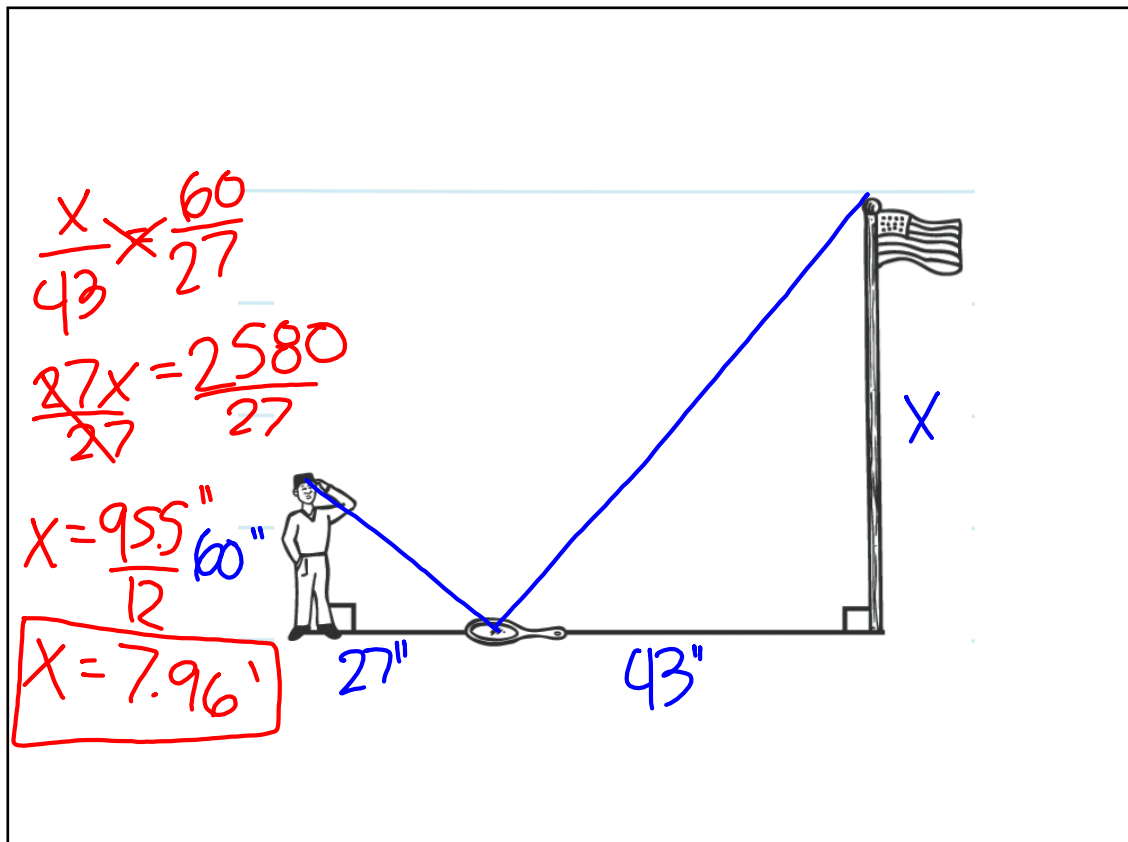
**Step 2:** Face the object you would like to measure and place the mirror between yourself and the object . You, the object, and the mirror should be collinear.

**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.



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.

