**LEARNING TARGETS**

- I can use AA~ to set up and solve proportions.
- I can use AA~ to solve indirect measurement problems in the real world.

1. Noah needs to know the height of a flagpole for a class project. He walks 12 feet away from the pole and places a mirror on the ground. He then walks away from the mirror so that he can see the top of the flagpole in the center of the mirror. The distance from Noah to the mirror is 48 inches and his eyes are 70 inches above the ground. How tall is the flagpole (in feet and inches, rounded to the nearest inch).

   a) Draw a diagram that represents the situation.

   b) Set up and solve a proportion to find the height of the flagpole.

2. Liza and Suzie are feeding ducks by a pond. While they're feeding the ducks, Suzie says to Liza, "I wonder how far it is across that pond." Liza replies, "Wow Suzie, that's a great question! Let's figure it out!" Here are the measurements they were able to get.

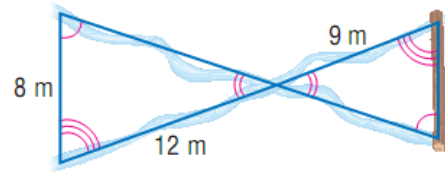75 feet

Suzie

25 feet

30 feet
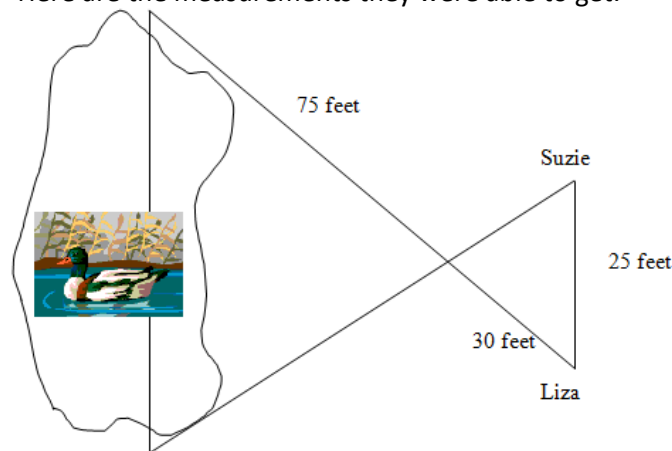
Liza

   a) Assuming that the line across the pond and the line that Liza and Suzie make are parallel, please explain why they will be able to find the distance across the pond.

   b) Set up and solve a proportion to find the distance across the pond.

1. How far is it from the log ride to the pirate ship?
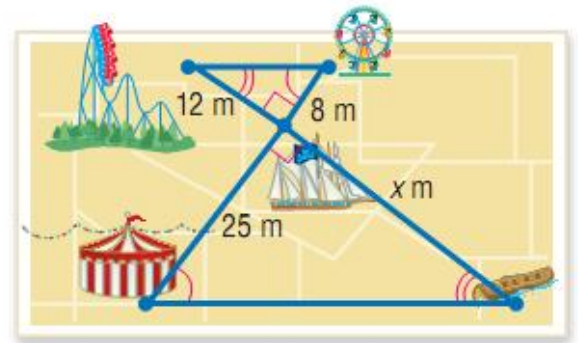
2. About how long is the log that runs across the creeks?

3. In order to estimate the height *h* of a flagpole, a 5 foot tall male student stands so that the tip of his shadow coincides with the tip of the flagpole's shadow. This scenario results in two similar triangles as shown in the diagram.

   a) Why are the two overlapping triangles similar?
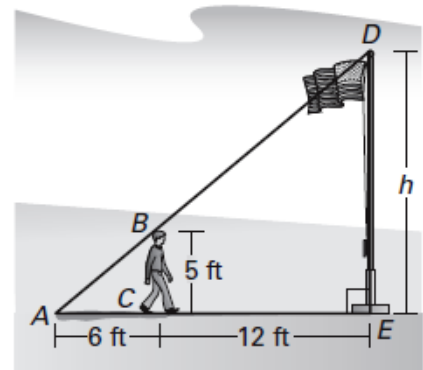
   b) What is the height *h* (in feet) of the flagpole?

4. You and your friend are standing next to each other outside. Your shadow is 23 inches long and your friend's shadow is 24 inches long. You are 5 feet 5 inches tall. How tall is your friend, in feet and inches to the nearest inch?

Answer Key:

1) 37.5 m
2) 6 m
3) a) They are similar by AA~. Both triangles are right triangles and have ∠A in common.
   b) 15 ft
4) About 5 ft 8 in.