

Prealgebra 6.9
 Solve problems involving indirect measurement using shadow reckoning
 Solve problems using surveying methods

similar triangles
 corresponding parts
 direct measurement
 indirect measurement
 what causes shadows?
 are they always the same?
 surveying

Mar 11-7:17 PM

$$\frac{6}{12} = \frac{8}{16} = \frac{9}{x}$$

$$6x = 108$$

$$x = 18$$

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Indirect Measurement

Why?
 On a sunny day, you can see your shadow. The lengths of the shadows around you are proportional to the heights of the objects casting the shadows.

a. What kind of triangles are formed by the objects and their shadows?
 b. **MAKE A CONJECTURE** How could you use your shadow to determine the height of another object?

$$\frac{1.8}{0.8} = \frac{1.2}{x}$$

$$0.8h = \frac{2.16}{0.8}$$

$$h = 2.7$$

Angle of the sun will be the same (as long as it is the same time of day)

Mar 11-7:25 PM

MEMORIALS The lead statue of the Korean War Memorial in Washington, D.C., casts a 43.5-inch shadow at the same time a nearby tourist casts a 32-inch shadow. If the tourist is 64 inches tall, how tall is the lead statue?

$$\frac{h}{64} = \frac{43.5}{32}$$

$$h = 87 \text{ in}$$

Mar 11-7:26 PM

Check Your Progress

1. **MONUMENTS** Suppose a bell tower casts a 27.6-foot shadow at the same time a nearby tourist casts a 1.2-foot shadow. If the tourist is 6 feet tall, how tall is the tower?

$$\frac{x}{6} = \frac{27.6}{1.2}$$

$$1.2x = \frac{165.6}{1.2}$$

$$1.38 \text{ ft}$$

Mar 11-7:26 PM

3. **FLAGS** A flagpole is 30 feet high and a mailbox is 3.5 feet high. The mailbox casts a shadow that is 5.25 feet long. How long is the flagpole's shadow at the same time?

exit ticket

6.9 wks skills
 1-5
 by 9:00 AM
 w/d

$$\frac{30}{x} = \frac{3.5}{5.25}$$

Mar 11-7:28 PM

4. **ARCHITECTURE** The height of Medina Middle School is 25 feet tall. A mail service drop box outside the school is 4 feet tall. The drop box casts a shadow that is 6 feet long. At the same time, what is the length of the shadow of the school building?

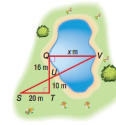
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EXAMPLE 2 Find Missing Measures

MAPS In the figure, $\triangle STU \sim \triangle VQU$. Find the distance across the pond.

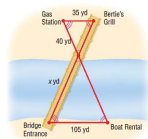
Are the triangles similar? How can we know?

(match up corresponding parts)



Mar 11-7:27 PM

5. **BRIDGES** The triangles below are similar. Find x .



Mar 11-7:29 PM

Feb 26-8:37 PM