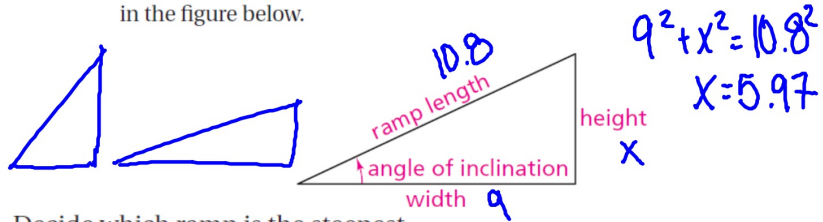


Launch: You can specify a ramp by giving any two of the measurements indicated in the figure below.



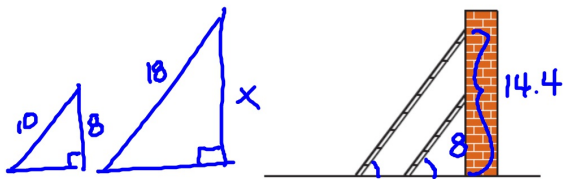
1. Decide which ramp is the steepest.

Use any method you like, such as constructing physical scale models, making graphical models, or using calculations. Be prepared to explain why your method is valid as well as why your choice is the steepest ramp.

- ~~A.~~ width 9.2 feet, height 3.3 feet $\frac{3.3}{9.2} = .358$
- ~~B.~~ ramp length 10.2 m, height 3.8 m $\frac{3.8}{9.47} = .401$
- ~~C.~~ height 3.1 feet, width 8.5 feet $\frac{3.1}{8.5} = .364$
- D.** width 9 m, ramp length 10.8 m $\frac{3.4}{5.4} = .663$
- ~~E.~~ ramp length 3 yards, angle of inclination 30° $.5$
- ~~F.~~ height 3 feet, width 7 feet $\frac{3}{7} = .428$

For You to Explore

2. Two ladders are leaned against a wall so that they make the same angle with the ground.



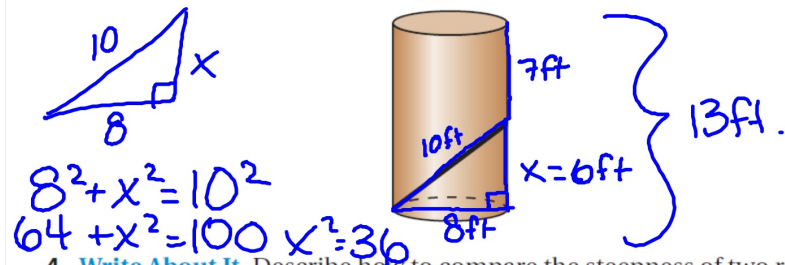
The 10-foot ladder reaches 8 feet up the wall. How much farther up the wall does the 18-foot ladder reach?

$$\frac{10}{8} = \frac{18}{x} \quad x = 14.4 \quad 6.4\text{ft}$$

6.5 Getting Started

Objective: To warm up to the ideas of the investigation.

3. Workers accidentally drop a metal pipe that is 10-feet long. It falls into a cylindrical hole with a radius of 4 feet and a grate across the top. The pipe comes to rest leaning across the bottom of the hole. The workers are able to just reach the upper end of the pipe through the grate with a magnet at the end of a rope that is 7-feet long. About how deep is the hole?



$$8^2 + x^2 = 10^2$$

$$64 + x^2 = 100 \quad x^2 = 36$$

4. **Write About It** Describe how to compare the steepness of two ramps given the following measurements for each ramp.

- ramp length and width
- ramp length and height
- width and height

On Your Own

Page 467: 5, 7

5. The width and height of four ramps are given. Which ramp is the steepest? Explain.
- A. width 10 feet, height 6 feet
 - B. width 5 miles, height 3 miles
 - C. width 15 inches, height 9 inches
 - D. width 50 cm, height 30 cm

7. Hannah's method for comparing the steepness of ramps is to construct a triangle that is similar to the triangle formed by the ramp, but with a width of 1. Then she compares the heights of the similar triangles in order to choose the steepest ramp. Try Hannah's method to determine which of the following ramps is the steepest.

- A. ramp length 18 cm, height 6 cm
- B. ramp length 43 inches, width 41 inches
- C. width 50.9 mm, height 18.5 mm

9. When you are standing at point A , you have to tilt your head up 27° to see the very top of a tree. You are 40 feet from the tree. Approximately how tall is the tree?

