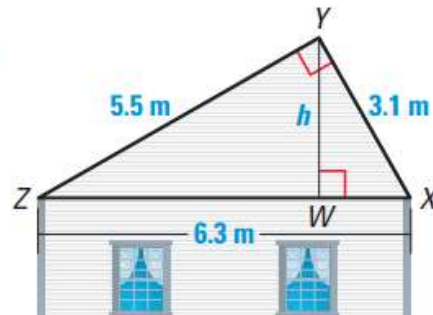**EXAMPLE 1** *Finding the Height of a Roof*

REAL LIFE

ROOF HEIGHT A roof has a cross section that is a right triangle. The diagram shows the approximate dimensions of this cross section.

a. Identify the similar triangles.

b. Find the height h of the roof.

5.5 m h 3.1 m

Y

Z   W   X

6.3 m

MONORAIL TRACK To estimate the height of a monorail track, your friend holds a cardboard square at eye level. Your friend lines up the top edge of the square with the track and the bottom edge with the ground. You measure the distance from the ground to your friend's eye and the distance from your friend to the track.

Not drawn to scale

track

X

$h - 5.75$ ft

h

W   16 ft   Y

Z

5.75 ft
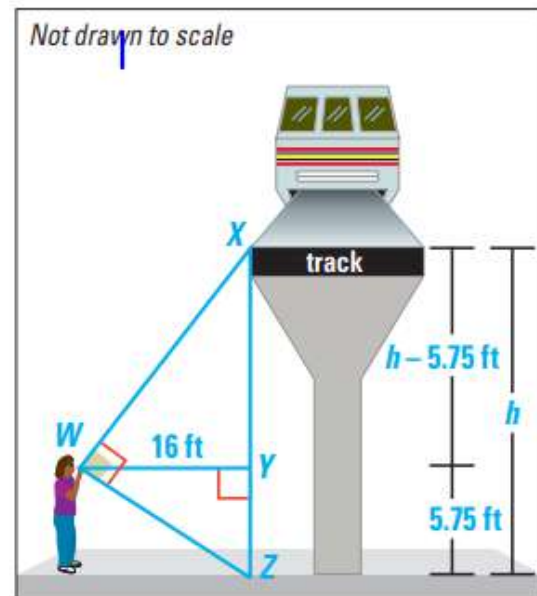
ROCK CLIMBING You and a friend want to know how much rope you need to climb a large rock. To estimate the height of the rock, you use the method from Example 3 on page 530. As shown at the right, your friend uses a square to line up the top and the bottom of the rock. You measure the vertical distance from the ground to your friend's eye and the distance from your friend to the rock. Estimate the height of the rock.

Not drawn to scale

18 ft

$5\frac{1}{2}$ ft

h