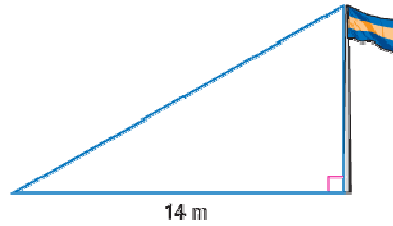


Lesson 11-2

Example 1

SCHOOL The flagpole in front of Kendra's school casts a shadow that is 14 m long. At the same time, Kendra, who is 140 cm tall, casts a shadow that is 245 cm long. What is the height of the flagpole?



Solution

The angle at which the sun's rays meet the ground is the same in both right triangles. Since the triangles have corresponding pairs of congruent angles, they are similar. Use this similarity to write and solve a proportion.

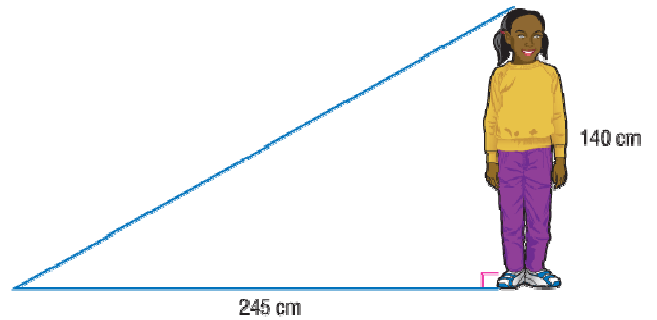
$$\frac{140}{h} = \frac{245}{14}$$

$$140 \cdot 14 = h \cdot 245 \quad \text{Find the cross-products.}$$

$$1960 = 245h$$

$$\frac{1960}{245} = \frac{245h}{245} \quad \text{Divide each side by 245.}$$

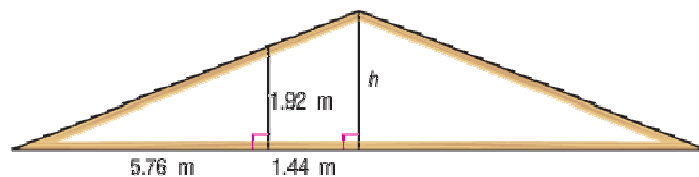
$$8 = h$$



The height of the flagpole is 8 m.

Example 2

What is the height of the roof?



Solution

Each right triangle shares a common angle, so they are similar. Use this similarity to write and solve a proportion.

$$\frac{5.76}{5.76 + 1.44} = \frac{1.92}{h}$$

$$5.76 \cdot h = (5.76 + 1.44) \cdot 1.92 \quad \text{Find the cross-products.}$$

$$5.76h = 13.824$$

$$h = 2.4$$

The height of the roof is 2.4 m.

Example 3

Christine uses the mirror method to find the height of a water slide at a theme park. She places the mirror 36 ft from the base of the slide and 4.5 ft from her feet. Christine is 5.25 ft tall. Find the height of the water slide.

Solution

Christine has established a pair of similar triangles. Christine's distance from the mirror corresponds to the distance from the mirror to the base of the slide. Her height corresponds to the height of the slide.

$$\frac{4.5}{36} = \frac{5.25}{h}$$

$$4.5 \cdot h = 36 \cdot 5.25$$

$$4.5h = 189$$

$$h = 42$$

The height of the slide is 42 ft.