

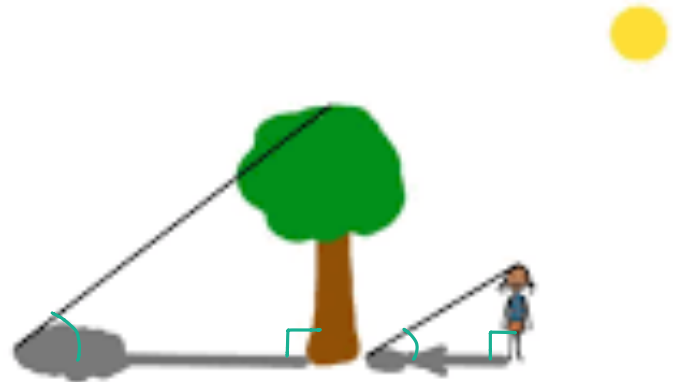
Indirect Measurement

- ▶ Calculating the height of an object, without actually measuring it.

Big Idea

★ Similar triangles can be used to measure an object indirectly.

★ $\frac{\text{tree height}}{\text{tree shadow}} = \frac{\text{person height}}{\text{person shadow}}$



EX:

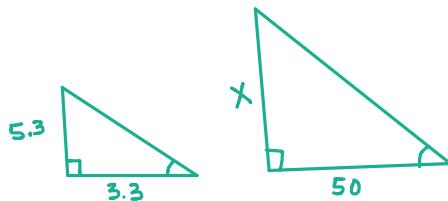
A flagpole casts a shadow that is 50 feet long. At the same time, a woman standing nearby who is five feet four inches tall casts a shadow that is 40 inches long. How tall is the flagpole to the nearest foot?

- (A) 12 feet (B) 40 feet
(C) 80 feet (D) 140 feet



* 5 ft 4 inches = 5.3 ft
* 40 inches = 3.3 ft

Divide inches by 12 to convert to feet



$$\frac{5.3}{X} = \frac{3.3}{50}$$

$$\frac{3.3x}{3.3} = \frac{265}{3.3}$$

$$x = 80.3 \text{ ft}$$

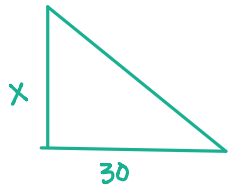
(C) 80 ft

Woman

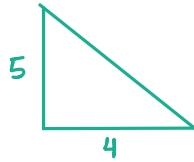
flag

EX:

- ▶ A tree casts a shadow that is 30 feet long. At the same time a person is standing nearby, who is 5 feet tall, casts a shadow that is 4 feet long. How tall is the tree?



Tree



person

$$\frac{x}{5} = \frac{30}{4}$$

$$4x = 150$$

$$x = 37.5 \text{ ft}$$

