**Indirect Measurement**

Uses similar figures and proportions to find missing lengths.

Steps
1. Draw pictures to give a visual of the 2 figures we are using.
2. Set up a proportion by placing the actual height as the numerators and the shadows as the denominators.
3. Cross products (multiply diagonally)
4. Set up an equation (using an = sign)
5. Divide both sides to solve for the variable

Ex. A tree is 8 ft. high and has a shadow of 12 ft. A larger tree has a shadow of 36 ft. How tall is the larger tree?
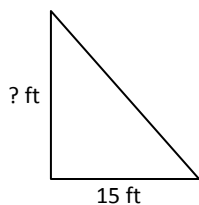


? ft

36 ft
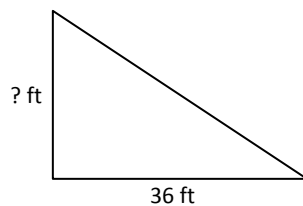
**Tree 2**

Tree 1  =  Tree 2

$$\frac{height}{shadow} = \frac{height}{shadow}$$

$$\frac{8}{12} = \frac{h}{36}$$

288 = 12h    (cross products)

$\boxed{24 \text{ ft} = h}$    (÷ both sides by 12)

Ex. A post cast a shadow of 15 ft. Another post is 8 ft tall and has a shadow of 6 feet. How tall is the 1$^{st}$ post?



8 ft

? ft

6 ft

15 ft
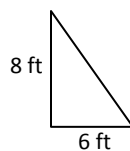
**Post 1**          **Post 2**

Post 1 = Post 2

$$\frac{height}{shadow} = \frac{height}{shadow}$$

$$\frac{h}{15} = \frac{8}{6}$$

6h = 120    (cross products)

$\boxed{h = 20 \text{ ft}}$ (÷ both sides by 6)