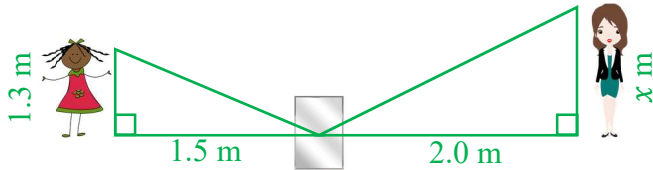


Lesson 11.3 – Indirect Measurement with Similar Triangles

- Ashton stands 1.5 m from a mirror that is 2.0 m from her principal's feet. If Ashton looks into the mirror, she can see the top of her principal's head. Ashton is 1.3 m tall. How tall is her principal?

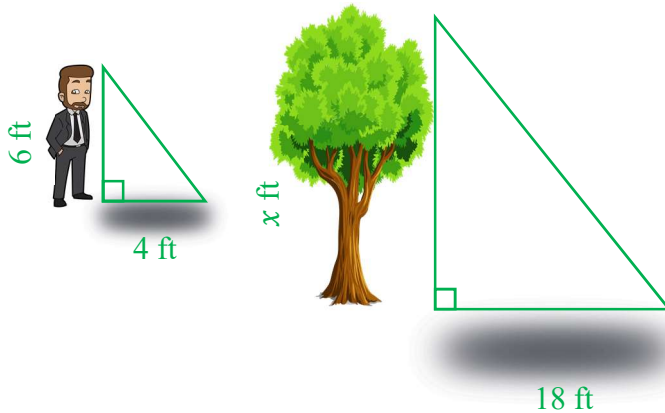


$$\frac{2.0}{1.5} = 1\frac{1}{3}$$

$$1.3 \cdot 1\frac{1}{3} \approx 1.7$$

The principal is about 1.7 m tall.

- At a certain time of day, a 6-foot man casts a 4-foot shadow. At the same time of day, how tall is a tree that casts an 18-foot shadow?

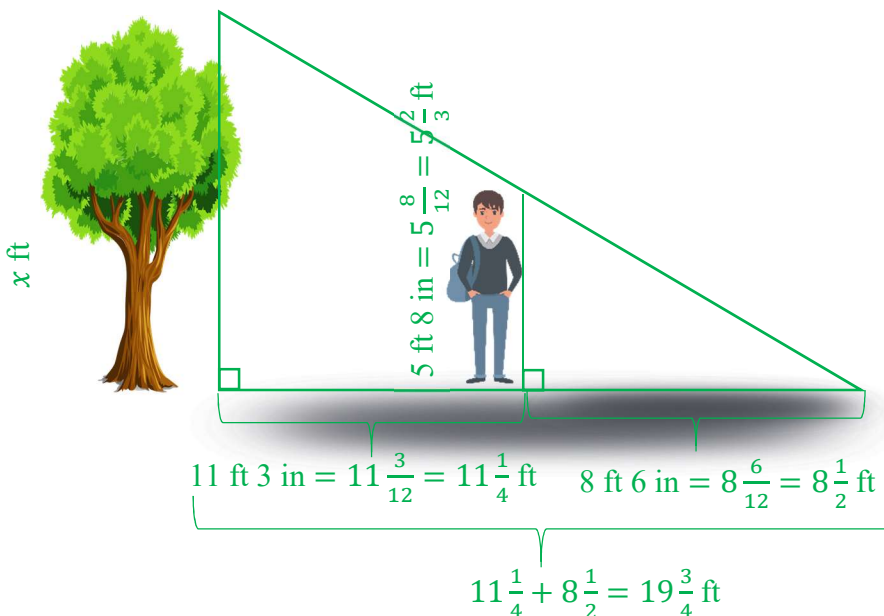


$$\frac{18}{4} = 4.5$$

$$6 \cdot 4.5 = 27$$

The tree is 27 feet tall.

- David is 5 ft 8 in. tall and wants to find the height of an oak tree in his front yard. He walks along the shadow of the tree until his head is in a position where the end of his shadow exactly overlaps the end of the tree's shadow. He is now 11 ft 3 in. from the foot of the tree and 8 ft 6 in. from the end of the shadows. How tall is the oak tree?



$$\frac{19\frac{3}{4}}{8\frac{1}{2}} = 2\frac{11}{34}$$

$$5\frac{2}{3} \cdot 2\frac{11}{34} = 13\frac{1}{6}$$

$$\frac{1}{6} \cdot 12 = 2$$

The tree is 13 feet 2 inches tall.

$$11\text{ ft } 3\text{ in} = 11\frac{3}{12} = 11\frac{1}{4}\text{ ft}$$

$$8\text{ ft } 6\text{ in} = 8\frac{6}{12} = 8\frac{1}{2}\text{ ft}$$

$$11\frac{1}{4} + 8\frac{1}{2} = 19\frac{3}{4}\text{ ft}$$