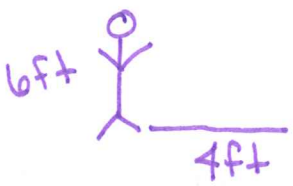
Name Key

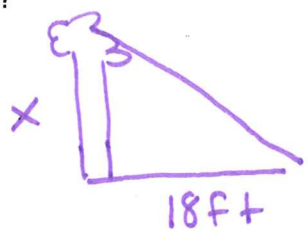
Indirect Measurement with Similar Triangles with Conversions

For each situation:

- Draw a picture if one is not drawn for you
- Show all work that you performed to determine your answer.
- Write the triangle similarity shortcut that you used to determine that the triangles were similar

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



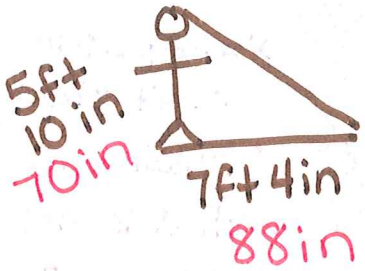


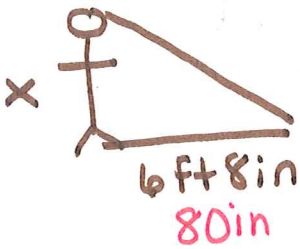
$\frac{x}{6} = \frac{18}{4}$

$x = 27$ ft

must have units for story problems.

2. If a 5 ft 10 in. person casts a 7 ft 4 in. shadow, how tall is a person who, at the same time, casts a 6 ft 8 in. shadow? Give your answer to the nearest inch.





$\frac{x}{70} = \frac{80}{88}$

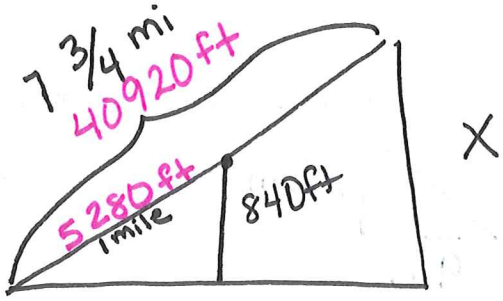
$88x = 5600$

$x = 63.\overline{63}$ in

5ft and 3.63in

3. Driving through the mountains, Dale has to go up and over a high mountain pass. The road has a constant incline for $7\,^{3}/_{4}$ miles to the top of the pass. Dale notices from a road sign that in the first mile, he climbed 840 ft. What is the height of the mountain pass? (5280 ft = 1 mile)

must convert to miles



$\frac{x}{840} = \frac{40920}{5280}$

$x = 6510$ ft

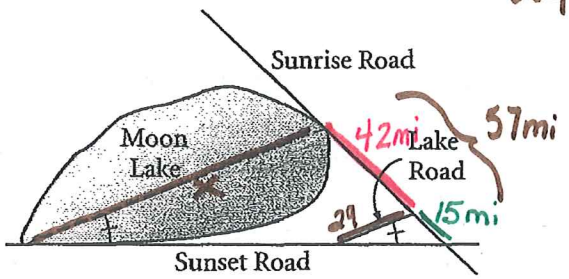
convert to miles

$x = 1$ mile and 1230 ft

or $x \approx 1.233$

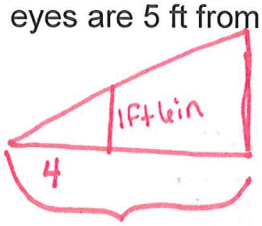
4. Sunrise Road is 42 miles long between the edge of Moon Lake and Lake Road and 15 miles long between Lake Road and Sunset Road. Lake Road is 29 miles long. Find the length of Moon Lake as indicated by the dotted line.

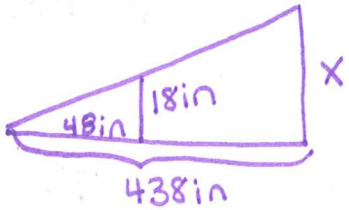
$$\frac{x}{29} = \frac{57}{15}$$



$x = 110.2$ miles

5. Martha is standing 4 ft behind a fence 6 ft 6 in. tall. When she looks over the fence, she can just see the top edge of a building. She knows that the building is 32 ft 6 in. behind the fence. Her eyes are 5 ft from the ground. How tall is the building? Give your answer to the nearest foot.





$$\frac{x}{438} = \frac{18}{48}$$

$x = 164.25$ in

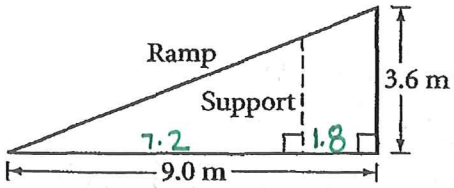
$+ 5$ ft = building

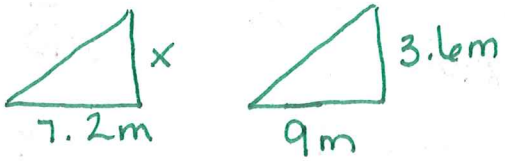
∴ building is 224.25 inches

$\Rightarrow 18.6875$ ft

≈ 19 ft

6. You need to add a support under the ramp. How long should the support be if it is 1.8m away from the first vertical support?





$$\frac{x}{3.6} = \frac{7.2}{9}$$

$x = 2.88$ m