Name ★Key★ Hr: _____

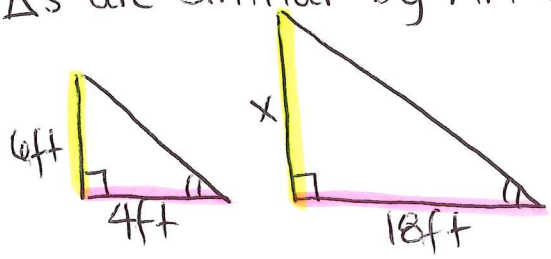
Indirect Measurement with Similar Triangles with Conversions

For each situation:

- Draw a picture if one is not drawn for you
- Show all work that you performed to determine your answer.(including conversions if needed)

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?

△s are similar by AA Similarity



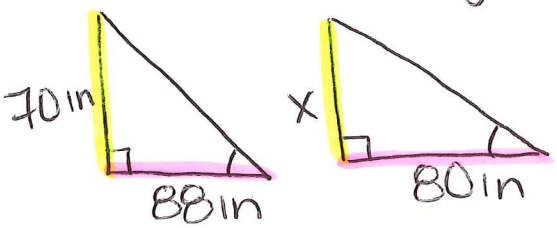
$\frac{6}{x} = \frac{4}{18}$

$4x = 108$

$x = 27$ ft

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. (Hint: covert feet to inches first!)

△s are similar by AA Similarity



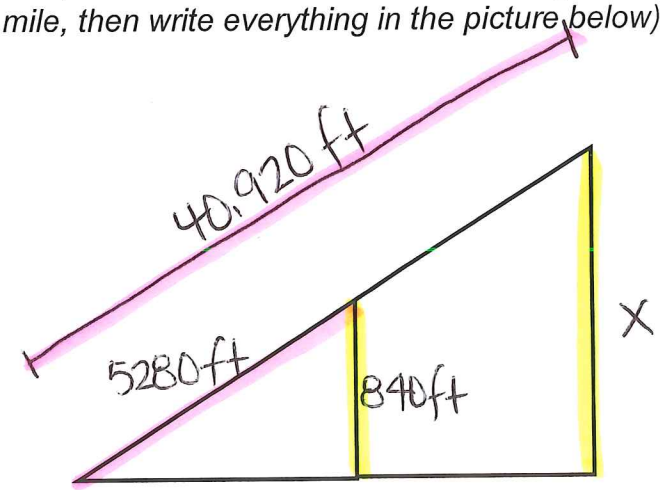
$\frac{70}{x} = \frac{88}{80}$

$88x = 5600$

$x = 63.\overline{63}$

$x \approx 64$in

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? *(Hint: covert to feet first, 5280 ft = 1 mile, then write everything in the picture below)*

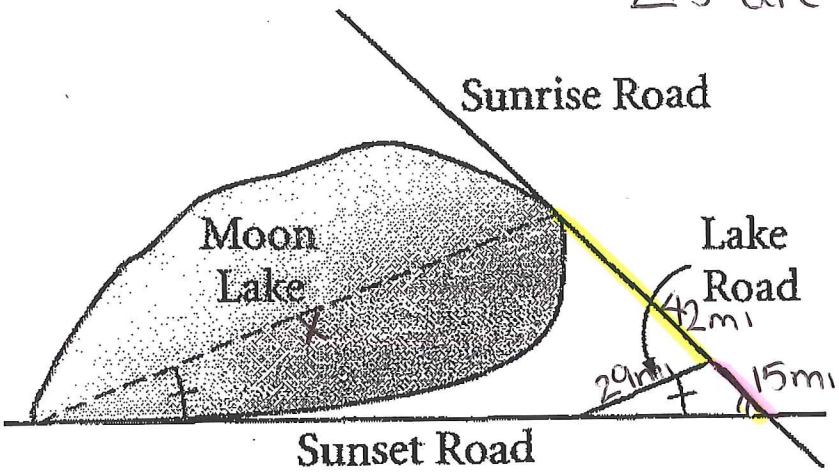


$\frac{40920}{5280} = \frac{x}{840}$

$5280x = 34372800$

$x = 6510$ ft

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.



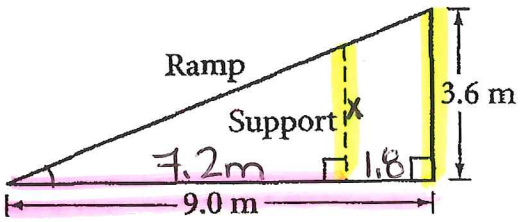
△s are similar by AA Similarity

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

$15x = 1653$

$x = 110.2\text{mi}$

5. 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?



△s are similar by AA Similarity

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

$9x = 25.92$

$x = 2.88\text{m}$