12.3 Proportional Relationships
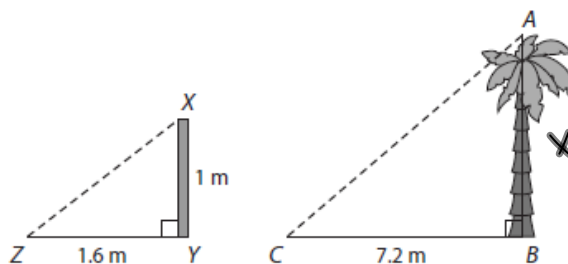
How can you use similar triangles to solve problems?

Indirect measurement- using the properties of similar triangles to measure heights or distances

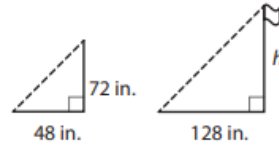Find the height of the palm tree if the figures are similar.

$$\frac{X}{1} = \frac{7.2}{1.6}$$

$$X = 4.5m$$

(B) Sid is 72 inches tall. To measure a flagpole, Sid stands near the flag. Sid's friend Miranda measures the lengths of Sid's shadow and the flagpole's shadow. Find the height h of the flagpole.

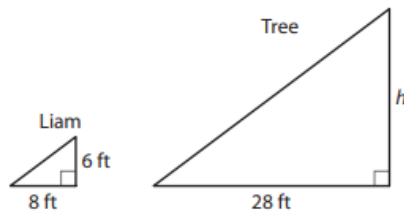The triangles are similar by the AA Triangle Similarity Theorem.

72 in.

48 in.   128 in.

$$\frac{h}{72} = \frac{128}{48}$$

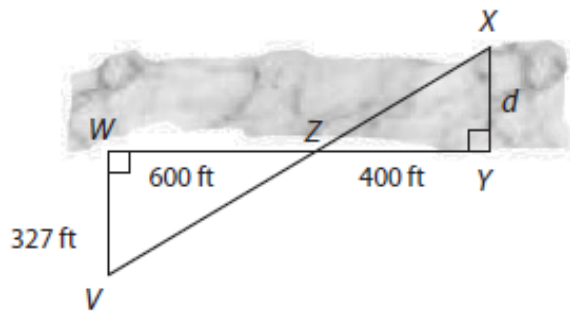$$\frac{48h}{48} = \frac{9,216}{48} \quad \boxed{h = 192 \text{ in.}}$$

3. Liam is 6 feet tall. To find the height of a tree, he measures his shadow and the tree's shadow. The measurements of the two shadows are shown. Find the height h of the tree.
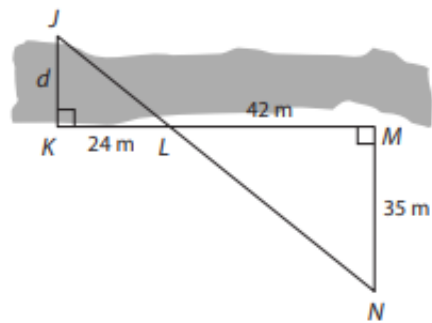
Tree

Liam

6 ft

8 ft

28 ft

h

$$\frac{h}{6} = \frac{28}{8}$$

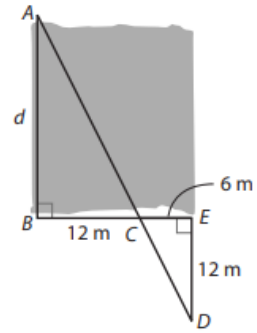$$\frac{8h}{8} = \frac{168}{8} \quad \boxed{h = 21 \text{ ft}}$$

Solve for d

B) To find the distance d across the gorge, a student identifies points as shown in the figure. Find d.

3

5. To find the distance d across a stream, Levi located points as shown in the figure. Use the given information to find d.

A figure showing a right triangle with vertex A at top, B at bottom left (right angle), C at 12 m from B. From C, a line goes to E and down to D. E has a right angle with 6 m marked and 12 m down to D. The distance d is the segment AB.

Homework
pg. 637 #3-8
pg. 657 #2-13