

NAME _____

Module 8 Points, Lines, Angles, and Triangles

Lesson 6 Similar Triangles

Lesson Objectives

- Determine if triangles are similar.
- Develop the properties of similar triangles (ratio of sides and congruent angles).
- Use similar triangles to solve problems.

Subtopic 1 Similar Triangles

Similar Figures

- Have the same **shape**
- May or may not be the same **size**
- Corresponding angles are **congruent**.
- Corresponding **sides** are proportional.

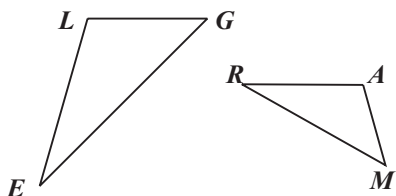
To **prove** two triangles are similar:

- Show **two** pairs of **angles** are congruent.
(AA Similarity Rule)
- Show that all **corresponding** sides are **proportional**.
(SSS Similarity Rule)



$\triangle LEG \sim \triangle ARM$

Which angles are congruent? Which sides are proportional?

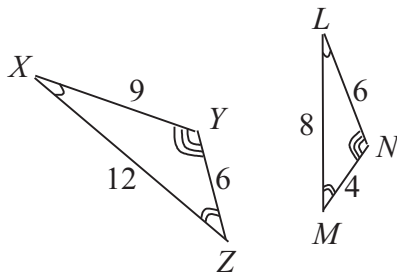


$$\angle L \cong \angle A, \angle E \cong \angle R, \angle G \cong \angle M$$

$$\begin{aligned} \overline{LE} &\text{ proportional to } \overline{AR} \\ \overline{LG} &\text{ proportional to } \overline{AM} \\ \overline{GE} &\text{ proportional to } \overline{MR} \end{aligned}$$



Determine if the two triangles are similar.



$$\angle X \cong \angle L, \angle Y \cong \angle N, \angle Z \cong \angle M$$

$$\frac{XY}{LN} \stackrel{?}{=} \frac{YZ}{NM} \stackrel{?}{=} \frac{XZ}{LM}$$

$$\frac{9}{6} \stackrel{?}{=} \frac{6}{4} \stackrel{?}{=} \frac{12}{8}$$

$$\frac{3}{2} = \frac{3}{2} = \frac{3}{2}$$

SSS Similarity Rule

$$\triangle XYZ \sim \triangle LNM$$

Subtopic 2

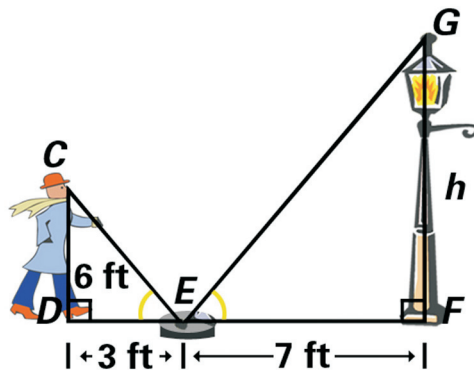
Using Similar Triangles

Indirect Measurement

A method of estimating distances that is **difficult** to measure directly



To measure the height of a street lamp, Rodney places a mirror on the ground and stands where he can see the top of the lamp in the mirror. Use the diagram to estimate the height of the street lamp.



$$\triangle CED \sim \triangle GEF$$

AA Similarity Rule

$$\frac{DE}{FE} = \frac{CD}{GF}$$

$$\frac{3}{7} = \frac{6}{h}$$

$$3 \times h = 7 \times 6$$

$$3 \times h = 42$$

$$\frac{3 \times h}{3} = \frac{42}{3}$$

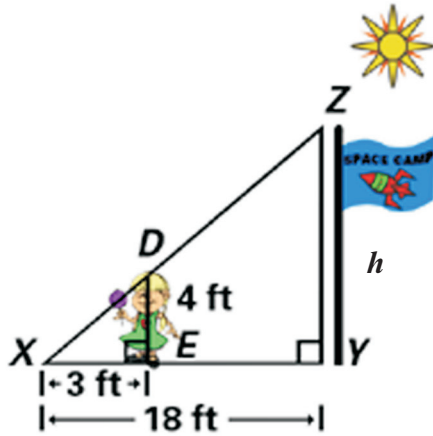
$$h = 14$$

14 feet tall

NAME _____

Module 8 Points, Lines, Angles, and Triangles
Lesson 6 Similar Triangles

- 4 To measure the height of a flagpole, Martha used shadows. Use the diagram to estimate the height of the flagpole.



$\triangle XED \sim \triangle XYZ$
AA Similarity Rule

$$\frac{XE}{XY} = \frac{DE}{ZY}$$

$$\frac{3}{18} = \frac{4}{h}$$

$$3 \times h = 18 \times 4$$

$$3 \times h = 72$$

$$\frac{3 \times h}{3} = \frac{72}{3}$$

$$h = 24$$

24 feet tall

