

## Lesson 11-6

### Example 1 Determine Whether Two Triangles Are Similar

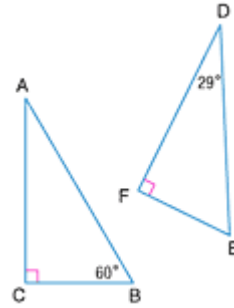
Determine whether the pair of triangles is similar. Justify your answer.

Remember that the sum of the measures of the angles in a triangle is  $180^\circ$ .

The measure of  $\angle A$  is  $180^\circ - (90^\circ + 60^\circ)$  or  $30^\circ$ .

The measure of  $\angle E$  is  $180^\circ - (90^\circ + 29^\circ)$  or  $61^\circ$ .

Since the corresponding angles do not have equal measures,  $\triangle ABC$  is not similar to  $\triangle DEF$ .



### Example 2 Find Missing Measures

Find the missing measures if each pair of triangles is similar.

- a. Since the corresponding angles have equal measures,  $\triangle ABC \sim \triangle DEF$ . The lengths of the corresponding sides are proportional.

$$\frac{AB}{DE} = \frac{AC}{DF}$$

Corresponding sides of similar triangles are proportional.

$$\frac{12}{8} = \frac{9}{s}$$

$$AB = 12, DE = 8, AC = 9, DF = s$$

$$12s = 72$$

Find the cross products.

$$s = 6$$

Divide each side by 12.

$$\frac{AB}{DE} = \frac{BC}{EF}$$

Corresponding sides of similar triangles are proportional.

$$\frac{12}{8} = \frac{5}{r}$$

$$AB = 12, DE = 8, BC = 5, EF = r$$

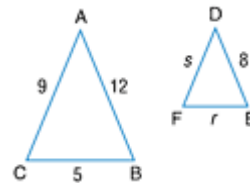
$$12r = 40$$

Find cross products.

$$r = \frac{10}{3}$$

Divide each side by 12 and simplify.

The missing measures are 6 and  $\frac{10}{3}$ .



- b.  $\triangle RST \sim \triangle XYZ$

$$\frac{RS}{XY} = \frac{ST}{YZ}$$

Corresponding sides of similar triangles are proportional.

$$\frac{2}{a} = \frac{2.5}{10}$$

$$RS = 2, XY = a, ST = 2.5, YZ = 10$$

$$20 = 2.5a$$

Find the cross products.

$$8 = a$$

Divide each side by 2.5.

$$\frac{RT}{XZ} = \frac{ST}{YZ}$$

Corresponding sides of similar triangles are proportional.

$$\frac{3}{b} = \frac{2.5}{10}$$

$$RT = 3, XZ = b, ST = 2.5, YZ = 10$$

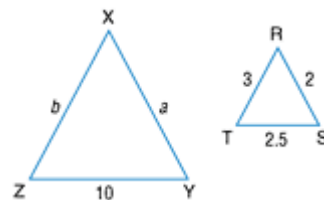
$$30 = 2.5b$$

Find the cross products.

$$12 = b$$

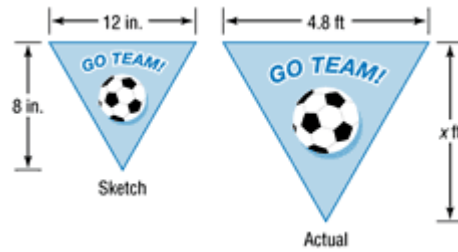
Divide each side by 2.5.

The missing measures are 8 and 12.



**Example 3 Use Similar Triangles to Solve a Problem**

April is making a triangular banner for her high school's upcoming soccer tournament. The sketch she has drawn has a height of 8 inches and a base of 12 inches. If the actual banner will have a base length of 4.8 feet, how tall will it be?



The banners form similar triangles. Write a proportion that compares the heights of the banners and the lengths of the bases.

Let  $x$  = the height of the banner

sketch length  $\rightarrow$   $\frac{12}{4.8}$   $\leftarrow$  sketch height  $\frac{8}{x}$

$$\frac{12}{4.8} = \frac{8}{x}$$

banner length  $\rightarrow$   $\frac{12}{4.8}$   $\leftarrow$  banner height  $\frac{8}{x}$

$$12x = 38.4 \quad \text{Cross products}$$
$$x = 3.2 \text{ feet} \quad \text{Divide each side by 12.}$$

The height of the banner will be 3.2 feet.