

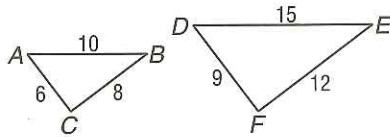
# 6-3 Study Guide and Intervention

## Similar Triangles

**Identify Similar Triangles** Here are three ways to show that two triangles are similar.

<b>AA Similarity</b>	Two angles of one triangle are congruent to two angles of another triangle.
<b>SSS Similarity</b>	The measures of the corresponding sides of two triangles are proportional.
<b>SAS Similarity</b>	The measures of two sides of one triangle are proportional to the measures of two corresponding sides of another triangle, and the included angles are congruent.

**Example 1** Determine whether the triangles are similar.



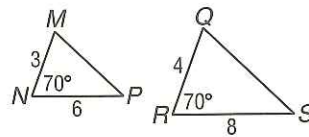
$$\frac{AC}{DF} = \frac{6}{9} = \frac{2}{3}$$

$$\frac{BC}{EF} = \frac{8}{12} = \frac{2}{3}$$

$$\frac{AB}{DE} = \frac{10}{15} = \frac{2}{3}$$

$\triangle ABC \sim \triangle DEF$  by SSS Similarity.

**Example 2** Determine whether the triangles are similar.



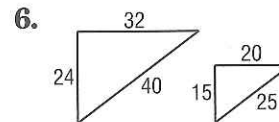
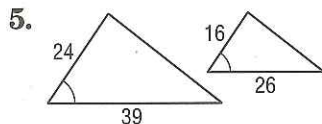
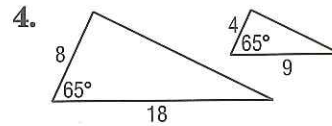
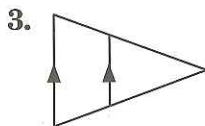
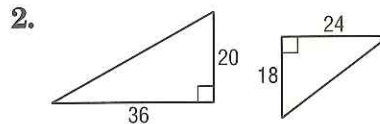
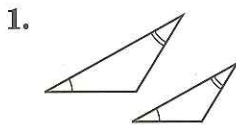
$$\frac{3}{4} = \frac{6}{8}, \text{ so } \frac{MN}{RQ} = \frac{NP}{QS}$$

$$m\angle N = m\angle R, \text{ so } \angle N \cong \angle R.$$

$\triangle MNP \sim \triangle RQS$  by SAS Similarity.

### Exercises

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



# 6-3 Study Guide and Intervention *(continued)*

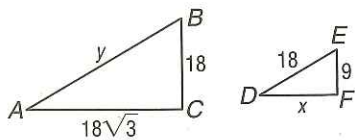
## Similar Triangles

**Use Similar Triangles** Similar triangles can be used to find measurements.

### Example 1

$$\triangle ABC \sim \triangle DEF.$$

Find  $x$  and  $y$ .



$$\frac{AC}{DF} = \frac{BC}{EF} \qquad \frac{AB}{DE} = \frac{BC}{EF}$$

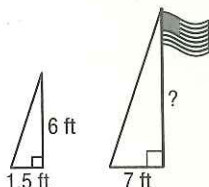
$$\frac{18\sqrt{3}}{x} = \frac{18}{9} \qquad \frac{y}{18} = \frac{18}{9}$$

$$18x = 9(18\sqrt{3}) \qquad 9y = 324$$

$$x = 9\sqrt{3} \qquad y = 36$$

### Example 2

A person 6 feet tall casts a 1.5-foot-long shadow at the same time that a flagpole casts a 7-foot-long shadow. How tall is the flagpole?

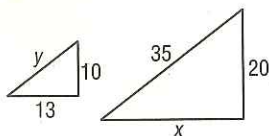


The sun's rays form similar triangles. Using  $x$  for the height of the pole,  $\frac{6}{x} = \frac{1.5}{7}$ , so  $1.5x = 42$  and  $x = 28$ . The flagpole is 28 feet tall.

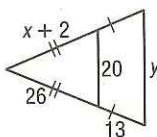
### Exercises

Each pair of triangles is similar. Find  $x$  and  $y$ .

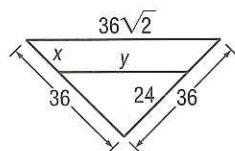
1.



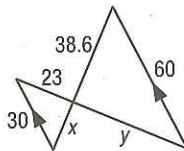
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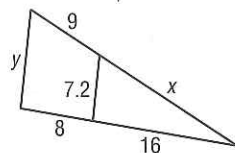
3.



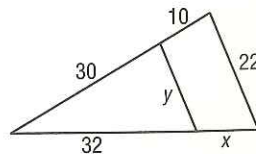
4.



5.



6.



7. The heights of two vertical posts are 2 meters and 0.45 meter. When the shorter post casts a shadow that is 0.85 meter long, what is the length of the longer post's shadow to the nearest hundredth?

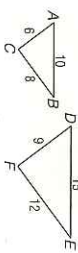
# 6-3

## Study Guide and Intervention Similar Triangles

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<b>AA Similarity</b>	Two angles of one triangle are congruent to two angles of another triangle.
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<b>SAS Similarity</b>	The measures of two sides of one triangle are proportional to the measures of two corresponding sides of another triangle, and the included angles are congruent.

**Example 1** Determine whether the triangles are similar.



$$\frac{AC}{DF} = \frac{6}{12} = \frac{1}{2}$$

$$\frac{BC}{EF} = \frac{8}{12} = \frac{2}{3}$$

$$\frac{AB}{DE} = \frac{10}{15} = \frac{2}{3}$$

$$\frac{DE}{DF} = \frac{15}{12} = \frac{5}{4}$$

$\triangle ABC \sim \triangle DEF$  by SSS Similarity.

**Example 2** Determine whether the triangles are similar.



$$\frac{3}{4} = \frac{6}{8}, \text{ so } \frac{MN}{QR} = \frac{NP}{RS}$$

$$\frac{4}{8} = \frac{6}{8}, \text{ so } \frac{MP}{SQ} = \frac{RS}{RS}$$

$m\angle N = m\angle R$ , so  $\angle N \cong \angle R$ .

$\triangle MNP \sim \triangle QRS$  by SAS Similarity.

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DATE \_\_\_\_\_

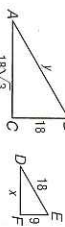
PERIOD \_\_\_\_\_

# 6-3

## Study Guide and Intervention Similar Triangles

**Use Similar Triangles** Similar triangles can be used to find measurements.

**Example 1**  $\triangle ABC \sim \triangle DEF$ . Find  $x$  and  $y$ .



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

$$\frac{18\sqrt{3}}{x} = \frac{18}{9}$$

$$18x = 9(18\sqrt{3})$$

$$x = 9\sqrt{3}$$

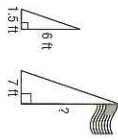
$$\frac{AB}{DE} = \frac{BC}{EF}$$

$$\frac{y}{18} = \frac{18}{9}$$

$$9y = 324$$

$$y = 36$$

**Example 2** A person 6 feet tall casts a 1.5-foot-long shadow at the same time that a flagpole casts a 7-foot-long shadow. How tall is the flagpole?



The sun's rays form similar triangles. Using  $x$  for the height of the pole,  $\frac{6}{1.5} = \frac{x}{7}$ , so  $1.5x = 42$  and  $x = 28$ . The flagpole is 28 feet tall.

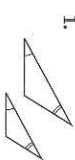
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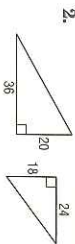
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### Exercises

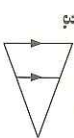
Determine whether each pair of triangles is similar. Justify your answer.



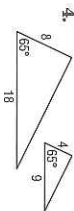
yes; AA Similarity



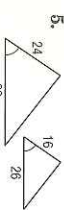
no;  $\frac{36}{24} \neq \frac{20}{18}$



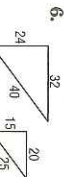
yes; AA Similarity



yes; SAS Similarity



yes; SAS Similarity

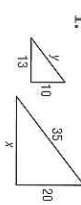


yes; SSS Similarity

### Lesson 6-3

### Exercises

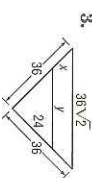
Each pair of triangles is similar. Find  $x$  and  $y$ .



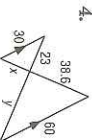
$x = 26$ ;  $y = 17.5$



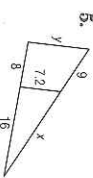
$x = 24$ ;  $y = 30$



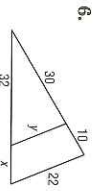
$x = 12$ ;  $y = 24\sqrt{2}$



$x = 19.3$ ;  $y = 46$



$x = 18$ ;  $y = 10.8$



$x = 10\frac{2}{3}$ ;  $y = 16\frac{1}{2}$

7. The heights of two vertical posts are 2 meters and 0.45 meter. When the shorter post casts a shadow that is 0.85 meter long, what is the length of the longer post's shadow to the nearest hundredth? **3.78 m**