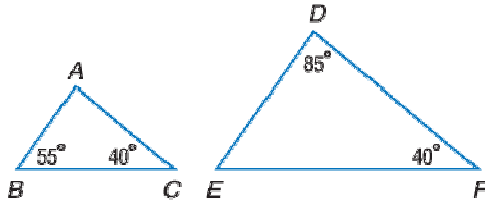


## Lesson 11-1

## Example 1

Determine if each pair of triangles is similar.

a.



b.



## Solution

a. Find the missing angle measures.

$$\begin{aligned} m\angle A &= 180^\circ - (55^\circ + 40^\circ) \\ &= 180^\circ - 95^\circ \\ &= 85^\circ \end{aligned}$$

$$\begin{aligned} m\angle E &= 180^\circ - (85^\circ + 40^\circ) \\ &= 180^\circ - 125^\circ \\ &= 55^\circ \end{aligned}$$

So  $\angle A \cong \angle D$  and  $\angle B \cong \angle E$ . Since corresponding pairs of angles are congruent,  $\triangle ABC \sim \triangle DEF$ .

b. Find the ratios of corresponding sides.

$$\frac{GH}{JK} = \frac{8}{12} = \frac{2}{3}$$

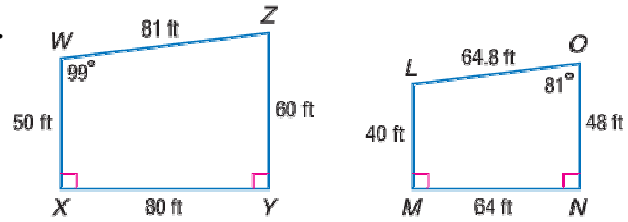
$$\frac{HI}{KL} = \frac{10}{15} = \frac{2}{3}$$

$$\frac{IG}{LJ} = \frac{6}{9} = \frac{2}{3}$$

The ratios are equivalent, so corresponding sides are in proportion and  $\triangle GHI \sim \triangle JKL$ .

**Example 2**

Determine if  $WXYZ$  is similar to  $LMNO$ .

**Solution**

Find the missing measures of the angles.

$$\begin{aligned} m\angle Z &= 360^\circ - (90^\circ + 90^\circ + 99^\circ) \\ &= 360^\circ - 279^\circ \\ &= 81^\circ \end{aligned}$$

$$\begin{aligned} m\angle L &= 360^\circ - (90^\circ + 90^\circ + 81^\circ) \\ &= 360^\circ - 261^\circ \\ &= 99^\circ \end{aligned}$$

Find the ratios of the corresponding sides.

$$\frac{LM}{WX} = \frac{40}{50} = \frac{4}{5}$$

$$\frac{MN}{XY} = \frac{64}{80} = \frac{4}{5}$$

$$\frac{NO}{YZ} = \frac{48}{60} = \frac{4}{5}$$

$$\frac{OL}{ZW} = \frac{64.8}{81} = \frac{4}{5}$$

Pairs of corresponding angles are congruent and pairs of corresponding sides are in proportion, so  $WXYZ \sim LMNO$ .

**Example 3**

**CONSTRUCTION** The family room in a new home will be 24 ft by 20 ft when it is completed. On an architect's blueprints for the room the length of the room is 1.5 ft long. How wide is the family room on the blueprints?

**Solution**

The drawing of the room on the architect's blueprints is similar to the actual room, so the corresponding sides are in proportion. Let  $w$  represent the width of the room on the blueprints.

$$\frac{24}{1.5} = \frac{20}{w}$$

$$24 \cdot w = 1.5 \cdot 20 \quad \text{Find the cross-products.}$$

$$w = \frac{30}{24} = 1.25 \quad \text{Solve for } w.$$

The width of the room on the blueprints is 1.25 ft, or 1 ft 3 in.