Reteaching with Practice

For use with pages 473–479

GOAL **Identify and use similar polygons**


VOCABULARY

When there is a correspondence between two polygons such that their corresponding angles are congruent and the lengths of corresponding sides are proportional the two polygons are called **similar polygons.**

Theorem 8.1   If two polygons are similar, then the ratio of their perimeters is equal to the ratios of their corresponding side lengths.

EXAMPLE 1 *Writing Similarity Statements*

Quadrilaterals *ABCD* and *EFGH* are similar. List all the pairs of congruent angles. Write the ratios of the corresponding sides in a statement of proportionality.
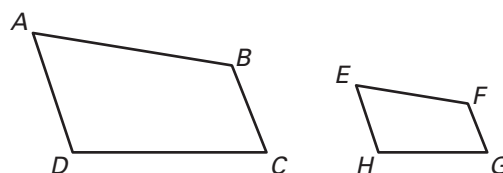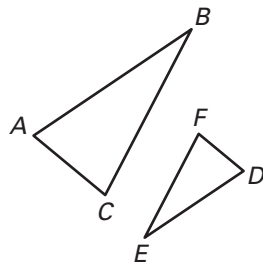

SOLUTION

Because *ABCD* ~ *EFGH* you can write∠*A* ≅ ∠*E*, ∠*B* ≅ ∠*F*, ∠*C* ≅ ∠*G*, and ∠*D* ≅ ∠*H*. You can write the statement of proportionality as follows:

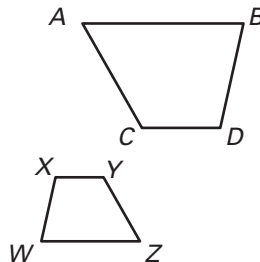$$\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE}.$$

Exercises for Example 1

The two polygons are similar. List all the pairs of congruent angles. Write the ratios of the corresponding sides in a statement of proportionality.
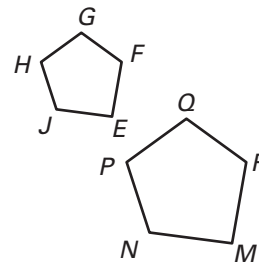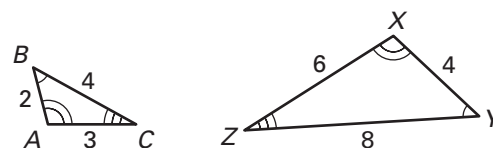
1. △*ABC* ~ △*DEF*

2. *ABDC* ~ *ZWXY*

3. *EFGHJ* ~ *MRQPN*

EXAMPLE 2 *Comparing Similar Polygons*

Decide whether the figures are similar. If they are similar, write a similarity statement.

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SOLUTION

The corresponding angles of $\triangle ABC$ and $\triangle XYZ$ are congruent. Also, the corresponding side lengths are proportional.
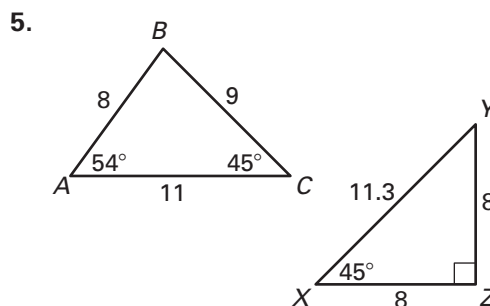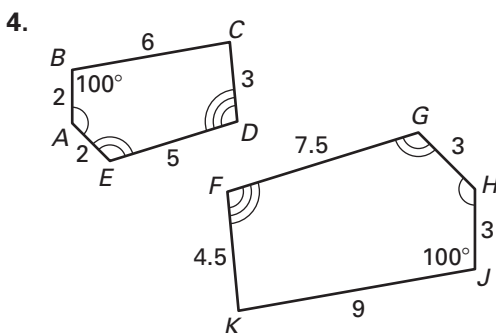
$$\frac{AB}{XY} = \frac{2}{4} = \frac{1}{2} \qquad\qquad \frac{BC}{YZ} = \frac{4}{8} = \frac{1}{2} \qquad\qquad \frac{CA}{ZX} = \frac{3}{6} = \frac{1}{2}$$

So, the two triangles are similar and you can write $\triangle ABC \sim \triangle XYZ$.

Exercises for Example 2

Are the polygons similar? If so, write a similarity statement.

4.

5.

EXAMPLE 3 *Using Similar Polygons*

Pentagon *ABCDE* is similar to pentagon *JKLMN*. Find the value of *x*.

SOLUTION

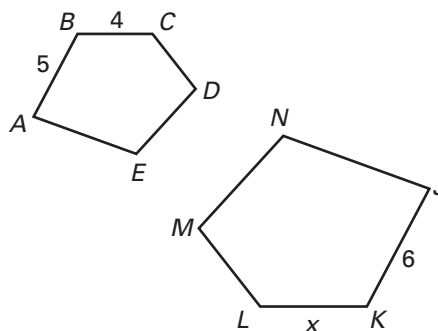Set up a proportion that contains *KL*.

$$\frac{AB}{JK} = \frac{BC}{KL} \qquad \text{Write a proportion.}$$

$$\frac{5}{6} = \frac{4}{x} \qquad \text{Substitute.}$$

$$x = 4.8 \qquad \text{Cross multiply and divide by 5.}$$

Exercises for Example 3

Find the value of x.

6. *ABCD ~ WXYZ*

7. *JKLMN ~ PQRST*

Lesson 8.3