

LESSON
4.2**Study Guide**

For use with pages 225–231

GOAL Identify congruent figures.**Vocabulary**

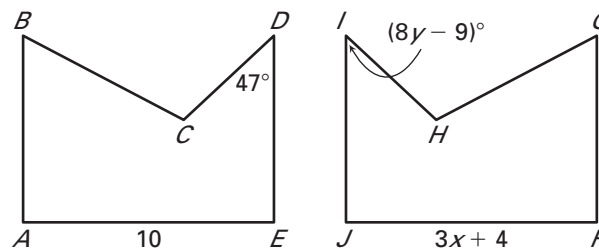
In two **congruent figures**, all the parts of one figure are congruent to the **corresponding parts** of the other figure. In congruent polygons, this means that the *corresponding sides* and the *corresponding angles* are congruent.

Theorem 4.3 Third Angles Theorem: If two angles of one triangle are congruent to two angles of another triangle, then the third angles are congruent.

EXAMPLE 1 Use properties of congruent figures

In the diagram, $ABCDE \cong FGHIJ$.

- Find the value of x .
- Find the value of y .

**Solution**

- You know that $\overline{AE} \cong \overline{FJ}$.

$$AE = JF$$

$$10 = 3x + 4$$

$$6 = 3x$$

$$2 = x$$

- You know that $\angle D \cong \angle I$.

$$m\angle D = m\angle I$$

$$47^\circ = (8y - 9)^\circ$$

$$47 = 8y - 9$$

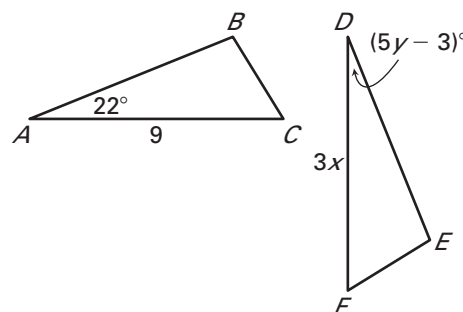
$$56 = 8y$$

$$7 = y$$

Exercises for Example 1

In the diagram, $\triangle ABC \cong \triangle DEF$.

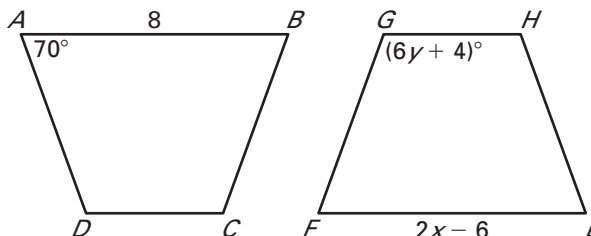
- Find the value of x .
- Find the value of y .



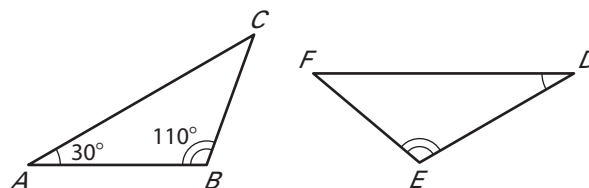
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In the diagram, $ABCD \cong EFGH$.

- Find the value of x .
- Find the value of y .


EXAMPLE 2 Use the Third Angles Theorem

Find $m\angle F$.


Solution

In the diagram, $\angle A \cong \angle D$ and $\angle B \cong \angle E$. So, by the Third Angles Theorem, $\angle C \cong \angle F$. By the Triangle Sum Theorem, $m\angle C = 180^\circ - 30^\circ - 110^\circ = 40^\circ$. So, $m\angle C = m\angle F = 40^\circ$ by the definition of congruent angles.

Exercises for Example 2

Find the value of x .

