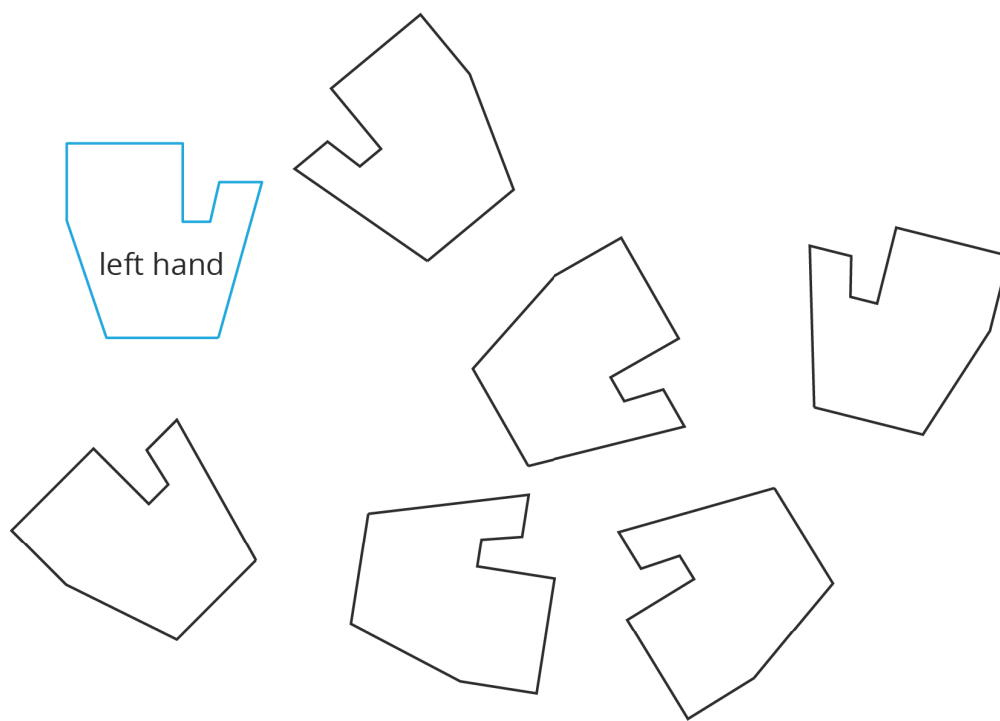# Unit 1, Lesson 11: What Is the Same?

Let's decide whether shapes are the same.

11.1: Find the Right Hands

A person's hands are mirror images of each other. In the diagram, a left hand is labeled. Shade all of the right hands.
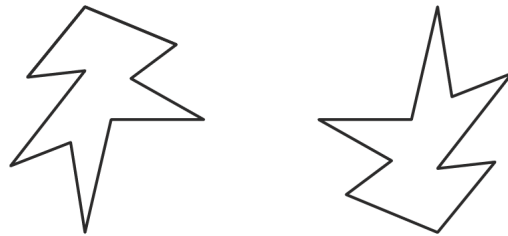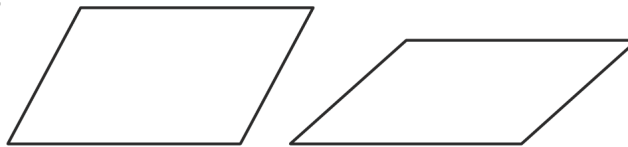
left hand

11.2: Are They the Same?

For each pair of shapes, decide whether or not they are the same.

A

B

C

D

E

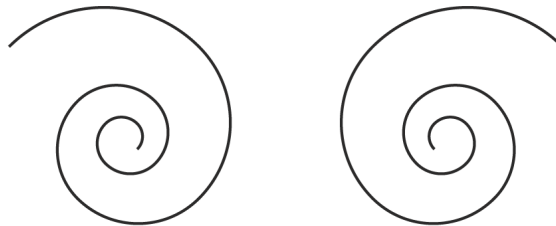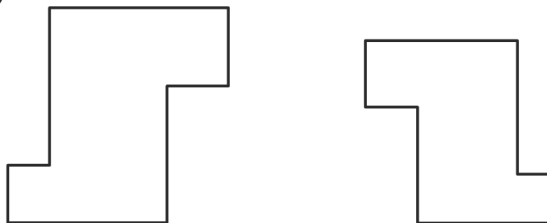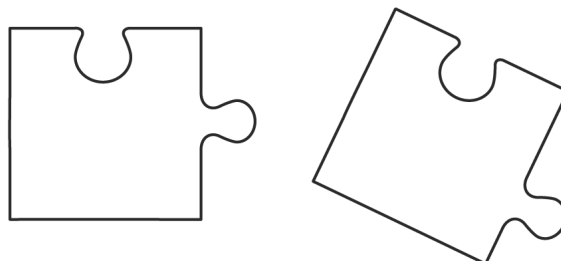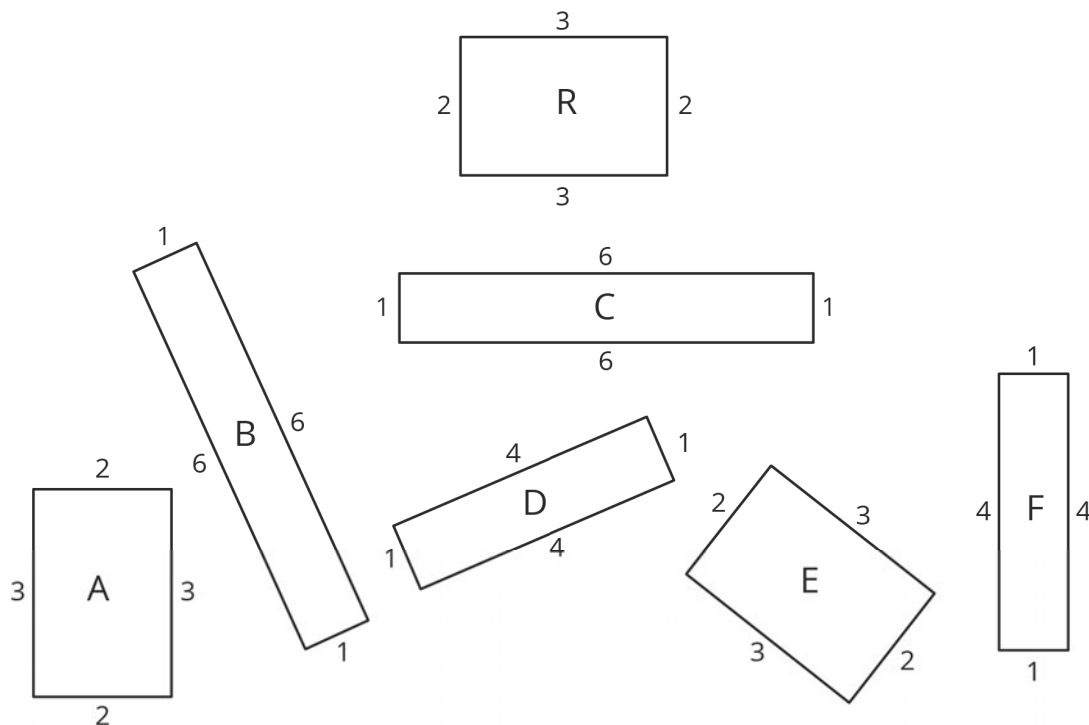## 11.3: Area, Perimeter, and Congruence

1. Which of these rectangles have the same area as Rectangle R but different perimeter?

2. Which rectangles have the same perimeter but different area?

3. Which have the same area *and* the same perimeter?

4. Use materials from the geometry tool kit to decide which rectangles are **congruent**.

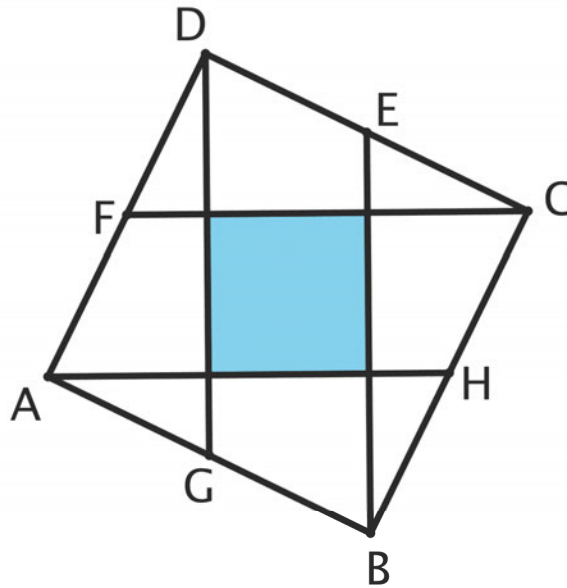Shade congruent rectangles with the same color.

Are you ready for more?

In square $ABCD$, points E, F, G, and H are midpoints of their respective sides. What fraction of square $ABCD$ is shaded? Explain your reasoning.

Lesson 11 Summary

Congruent is a new term for an idea we have already been using. We say that two figures are congruent if one can be lined up exactly with the other by a sequence of rigid transformations. For example, triangle EFD is congruent to triangle ABC because they can be matched up by reflecting triangle ABC across AC followed by the translation shown by the arrow. Notice that all corresponding angles and side lengths are equal.
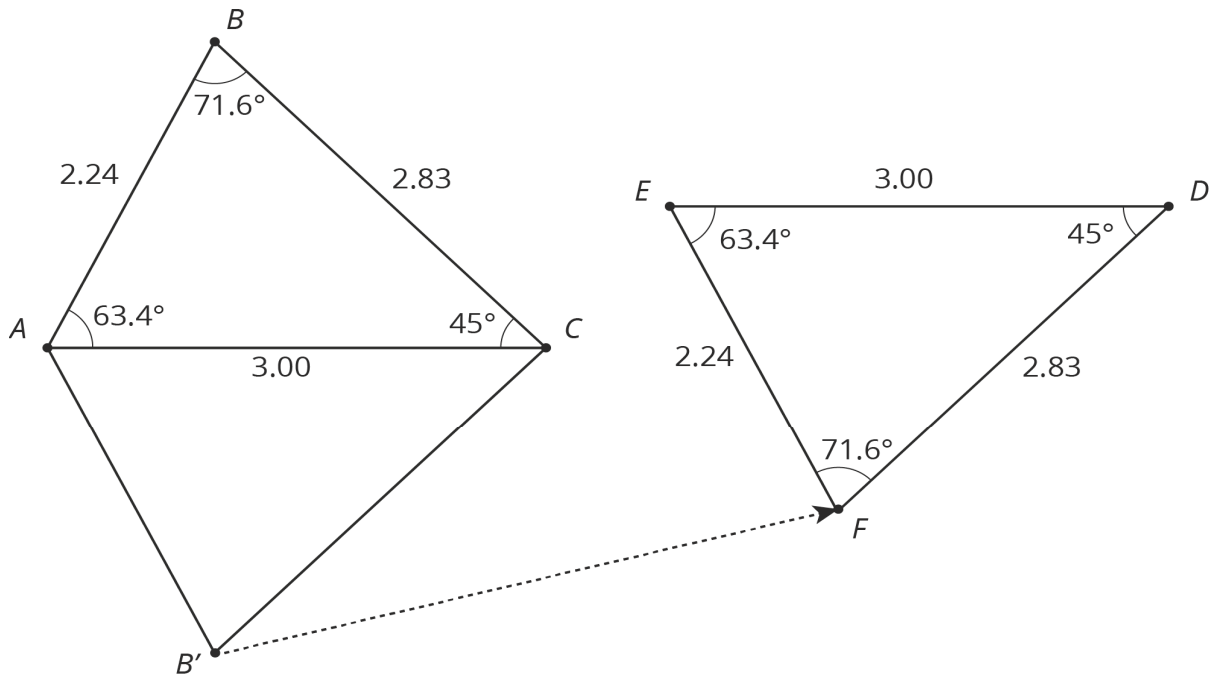
Here are some other facts about congruent figures:

- We don't need to check all the measurements to prove two figures are congruent; we just have to find a sequence of rigid transformations that match up the figures.

- A figure that looks like a mirror image of another figure can be congruent to it. This means there must be a reflection in the sequence of transformations that matches up the figures.

- Since two congruent polygons have the same area and the same perimeter, one way to show that two polygons are *not* congruent is to show that they have a different perimeter or area.

Lesson 11 Glossary Terms

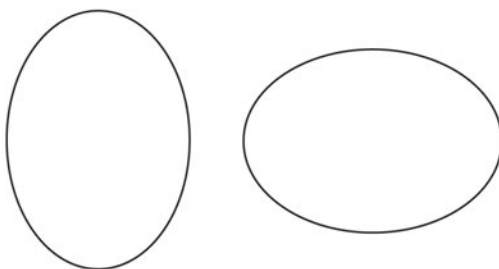- congruent

NAME   DATE   PERIOD

Unit 1, Lesson 11: What Is the Same?

1. If two rectangles have the same perimeter, do they have to be congruent? Explain how you know.
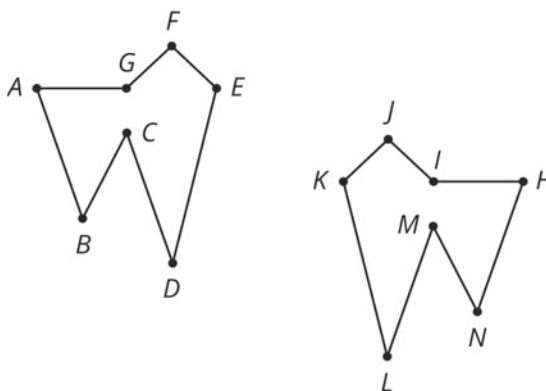
2. Draw two rectangles that have the same area, but are *not* congruent.

3. For each pair of shapes, decide whether or not it appears that the two shapes are congruent. Explain your reasoning.
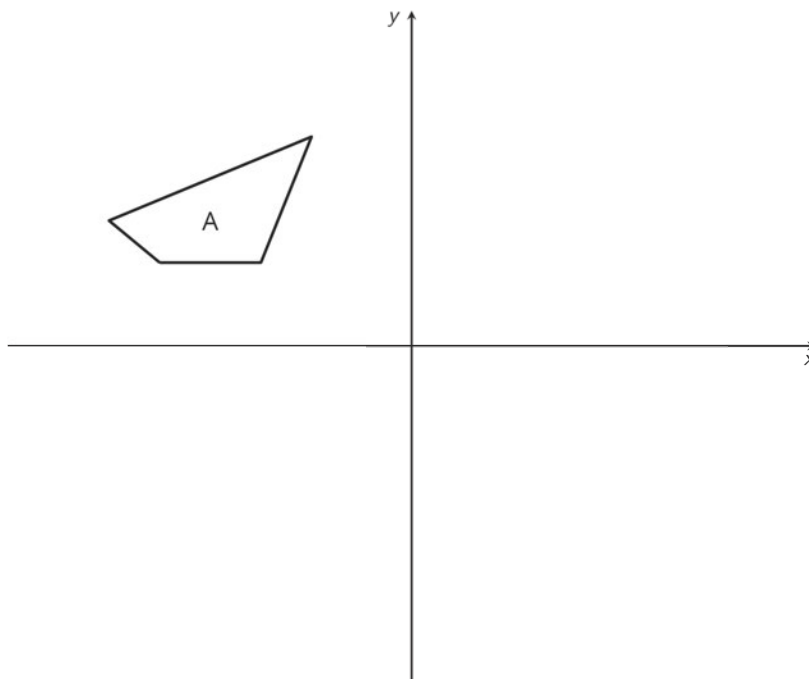
a.

b.

NAME   DATE   PERIOD

4. a. Reflect Quadrilateral A over the x-axis. Label the image quadrilateral B. Reflect Quadrilateral B over the y-axis. Label the image C.

b. Are Quadrilaterals A and C congruent? Explain how you know.

5. The point $(-2, -3)$ is rotated 90 degrees counterclockwise using center $(0, 0)$. What are the coordinates of the image?

A. $(-3, -2)$
B. $(-3, 2)$
C. $(3, -2)$
D. $(3, 2)$

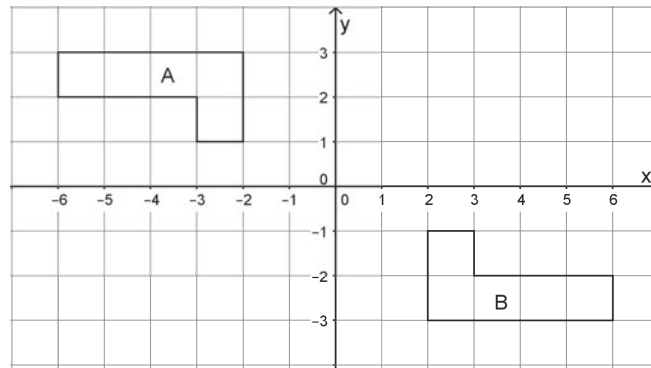(from Unit 1, Lesson 6)

6. Describe a rigid transformation that takes Polygon A to Polygon B.

(from Unit 1, Lesson 7)