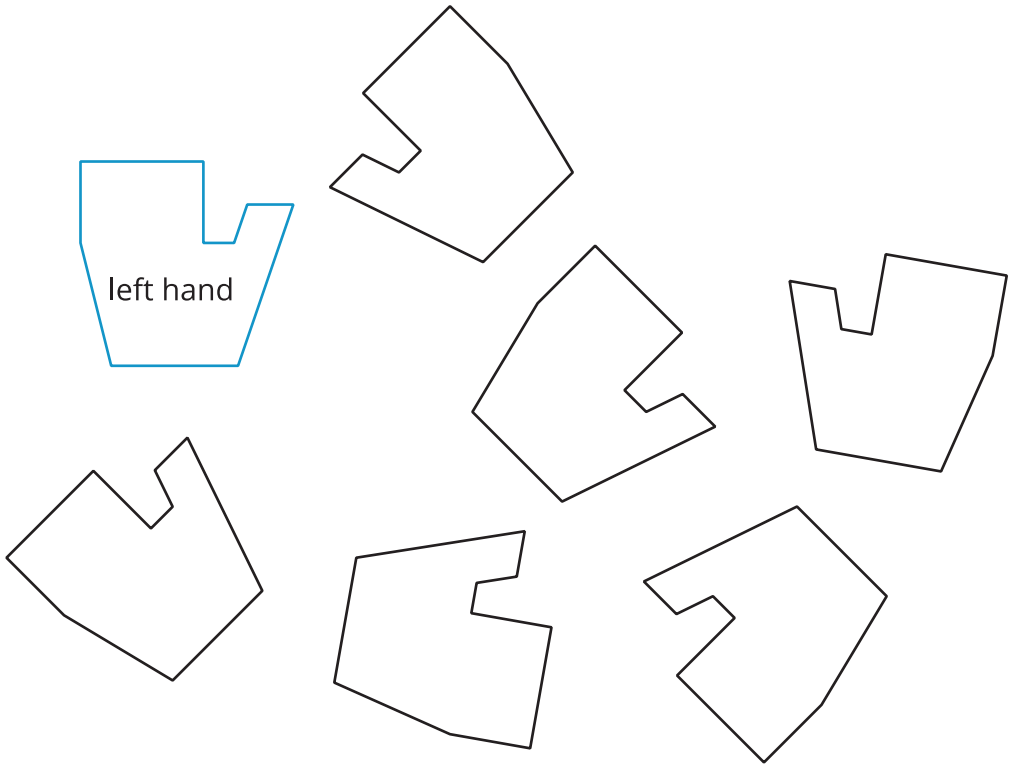
What Is the Same?

Let's decide whether shapes are the same.

10.1 Find the Right Hands

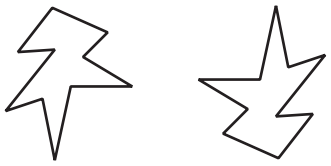
A person's hands are mirror images of each other. In the diagram, a left hand is labeled. Shade all of the right hands.



10.2 Are They the Same?

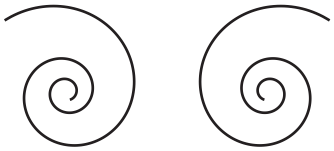
For each pair of shapes, decide whether or not they are the same.

A

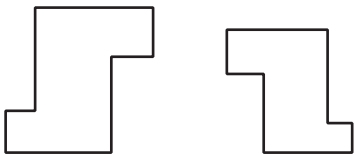


B

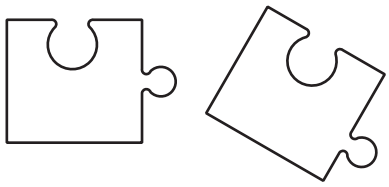
C



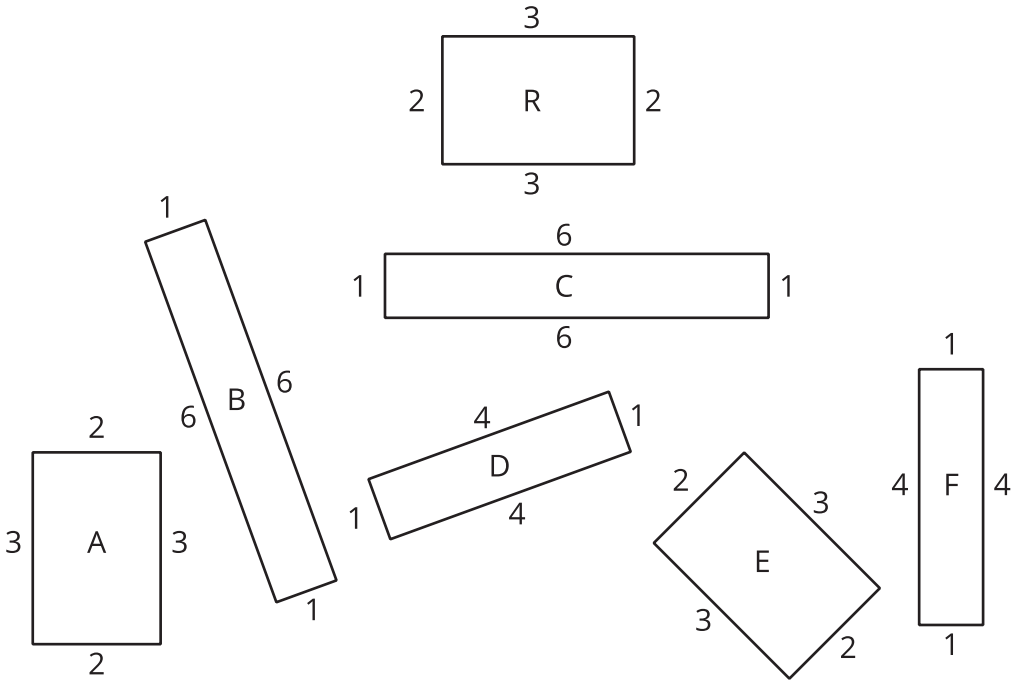
D



E



10.3 Area, Perimeter, and Congruence



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

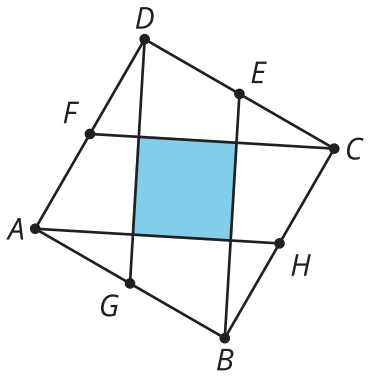
2. Which rectangles have the same perimeter as Rectangle R but a different area?

3. Which rectangles have the same area *and* the same perimeter as Rectangle R?

4. Decide which rectangles are **congruent**. Shade congruent rectangles with the same color.

Are you ready for more?

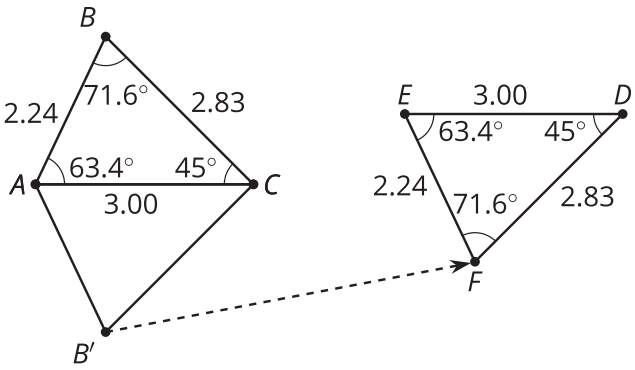
In square $ABCD$, points E, F, G, and H are midpoints of their respective sides. What fraction of square $ABCD$ is shaded? Explain your reasoning.



Lesson 10 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 rigid transformation.

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 rigid transformation that matches 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 area or perimeter.