7B Relationships for Congruent Shapes

GOAL Investigate relationships among area, perimeter, corresponding side lengths, and corresponding angle measures of congruent shapes.

You will need
- a geoboard and elastic bands, or centimetre dot paper
- a ruler
- a protractor

Explore the Math

Yuki is comparing the area, perimeter, **corresponding sides**, and **corresponding angles** of congruent shapes.

? How are congruent shapes related?

A. Construct two congruent triangles on a geoboard or on square dot paper.

B. Measure each pair of corresponding angles. What do you notice?

C. Measure each pair of corresponding sides. What do you notice?

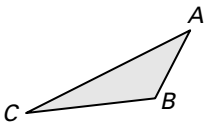
D. Calculate the perimeter of each shape. What do you notice?

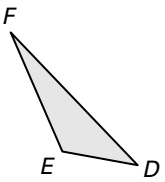
E. Compare the areas by counting squares and part squares, measuring dimensions and calculating, or placing one shape over the other. What do you notice?

F. Repeat steps A to E for congruent quadrilaterals.

corresponding angles

angles that are in the same positions in different shapes





ΔABC is congruent to ΔDEF.

Corresponding angles are $\angle A$ and $\angle D$, $\angle B$ and $\angle E$, and $\angle C$ and $\angle F$.

corresponding sides

sides that are in the same positions in different shapes

In ΔABC and ΔDEF, corresponding sides are AB and DE, BC and EF, CA and FD.

Reflecting

1. Does the orientation of shapes affect which angles are corresponding or which sides are corresponding? Why or why not?

2. a) Suppose you constructed a reflection or rotation image of a polygon. What would you know about corresponding sides and angles of the image and pre-image? Explain why you would know.

b) Suppose you constructed a translation image of a polygon. What would you know about the perimeter and the area of the image and pre-image?

3. Is each statement true? If so, explain why. If not, give an example.

a) Shapes with the same area must be congruent.

b) Congruent shapes must have the same perimeter.

c) Shapes that have the same perimeter must have corresponding sides of equal length.

Copyright © 2006 by Thomson Nelson