## Unit 3 Lesson 8: Are They All Similar?

### 1 Stretched or Distorted? Rectangles (Warm up)

#### Student Task Statement



Are these rectangles similar? Explain how you know.

### 2 Faulty Logic

#### Student Task Statement

Tyler wrote a proof that all rectangles are similar. Make the image Tyler describes in each step in his proof. Which step makes a false assumption? Why is it false?

1. Draw 2 rectangles. Label one and the other .
2. Translate rectangle by the directed line segment from to . and now coincide. The points coincide because that’s how we defined our translation.
3. Rotate rectangle by angle . Segment now lies on ray . The rays coincide because that’s how we defined our rotation.
4. Dilate rectangle using center and scale factor . Segments and now coincide. The segments coincide because was the center of the rotation, so and don’t move, and since and are on the same ray from , when we dilate by the right scale factor, it will stay on ray but be the same distance from as is, so and will coincide.
5. Because all angles of a rectangle are right angles, segment now lies on ray . This is because the rays are on the same side of  and make the same angle with it. (If and don’t coincide, reflect across so that the rays are on the same side of .)
6. Dilate rectangle using center and scale factor . Segments and now coincide by the same reasoning as in step 4.
7. Due to the symmetry of a rectangle, if 2 rectangles coincide on 2 sides, they must coincide on all sides.

### 3 Always? Prove it!

#### Student Task Statement

Choose one statement from the list. Decide if it is true or not.

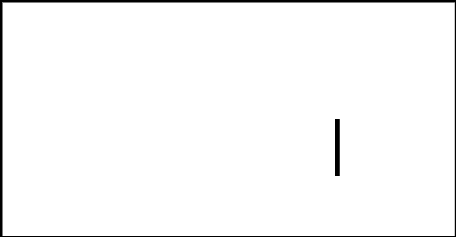
If it is true, write a proof. If it is not, provide a counterexample.

Repeat with another statement.

Statements:

1. All equilateral triangles are similar.
2. All isosceles triangles are similar.
3. All right triangles are similar.
4. All circles are similar.

#### Activity Synthesis





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