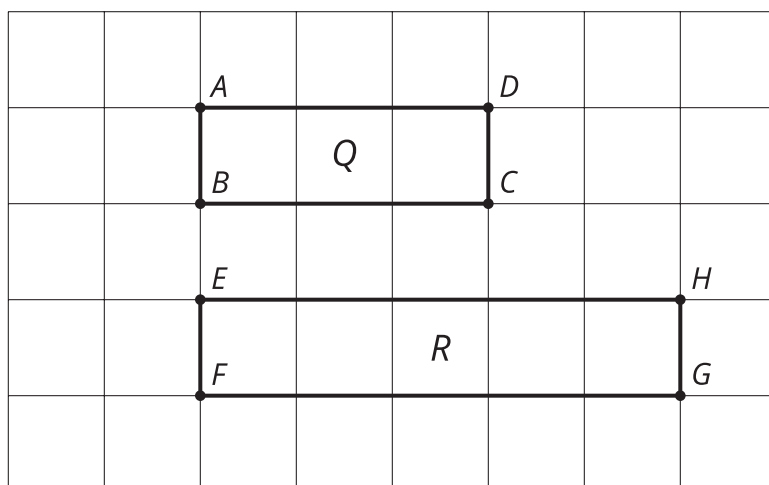


Unit 3 Lesson 8: Are They All Similar?

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 $ABCD$ and the other $PQRS$.
2. Translate rectangle $ABCD$ by the directed line segment from A to P . A' and P now coincide. The points coincide because that's how we defined our translation.
3. Rotate rectangle $A'B'C'D'$ by angle $D'A'S$. Segment $A''D''$ now lies on ray PS . The rays coincide because that's how we defined our rotation.
4. Dilate rectangle $A''B''C''D''$ using center A'' and scale factor $\frac{PS}{AD}$. Segments $A'''D'''$ and PS now coincide. The segments coincide because A'' was the center of the rotation, so A'' and P don't move, and since D'' and S are on the same ray from A'' , when we dilate D'' by the right scale factor, it will stay on ray PS but be the same distance from A'' as S is, so S and D''' will coincide.
5. Because all angles of a rectangle are right angles, segment $A'''B'''$ now lies on ray PQ . This is because the rays are on the same side of PS and make the same angle with it. (If $A'''B'''$ and PQ don't coincide, reflect across PS so that the rays are on the same side of PS .)
6. Dilate rectangle $A'''B'''C'''D'''$ using center A''' and scale factor $\frac{PQ}{AB}$. Segments $A''''B''''$ and PQ 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

