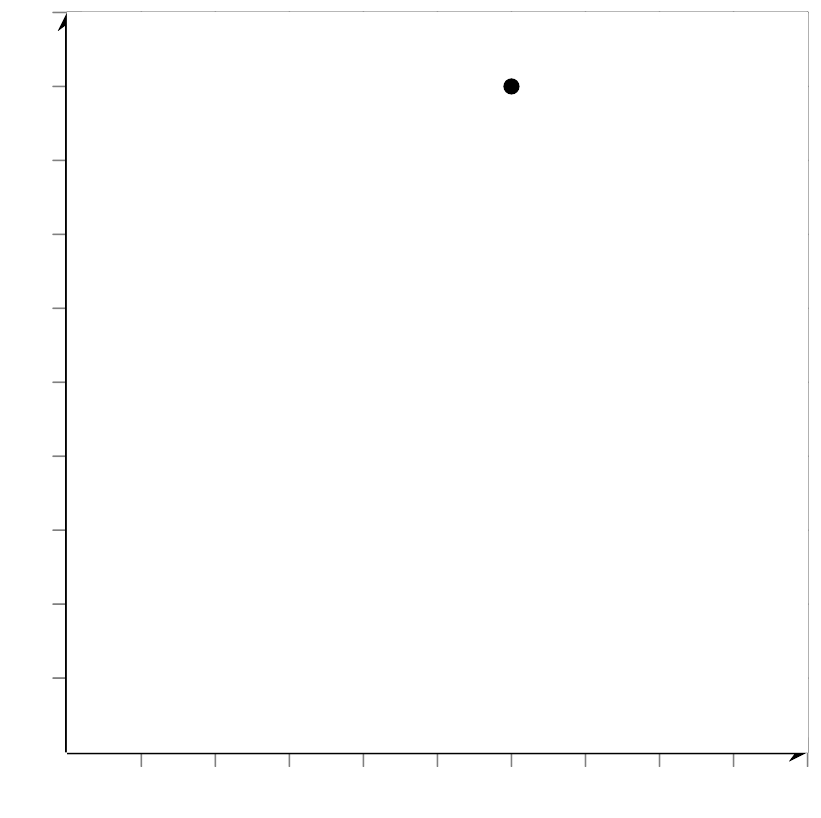
## Lesson 3: Types of Transformations

* Let’s analyze transformations that produce congruent and similar figures.

### 3.1: Why is it a Dilation?

Point was transformed using the coordinate rule .

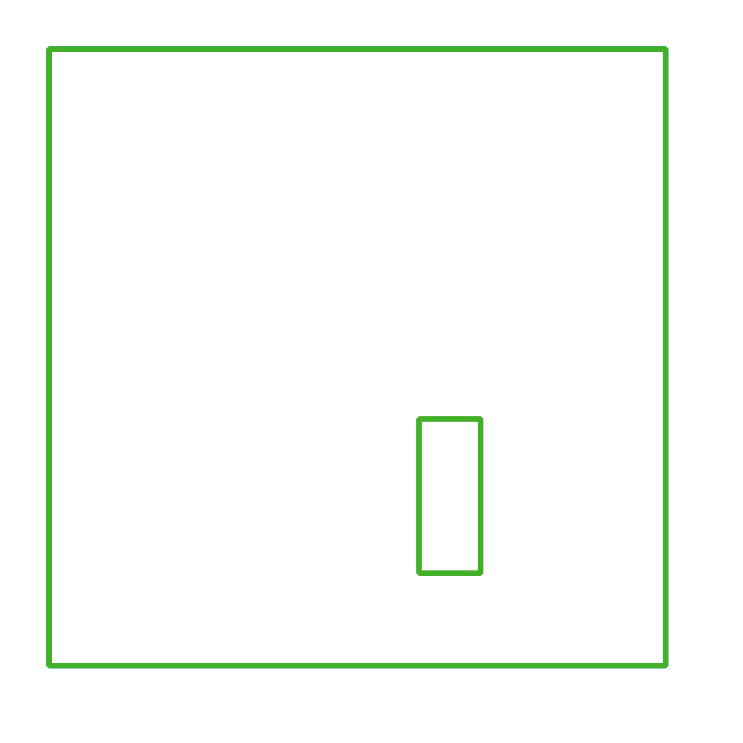


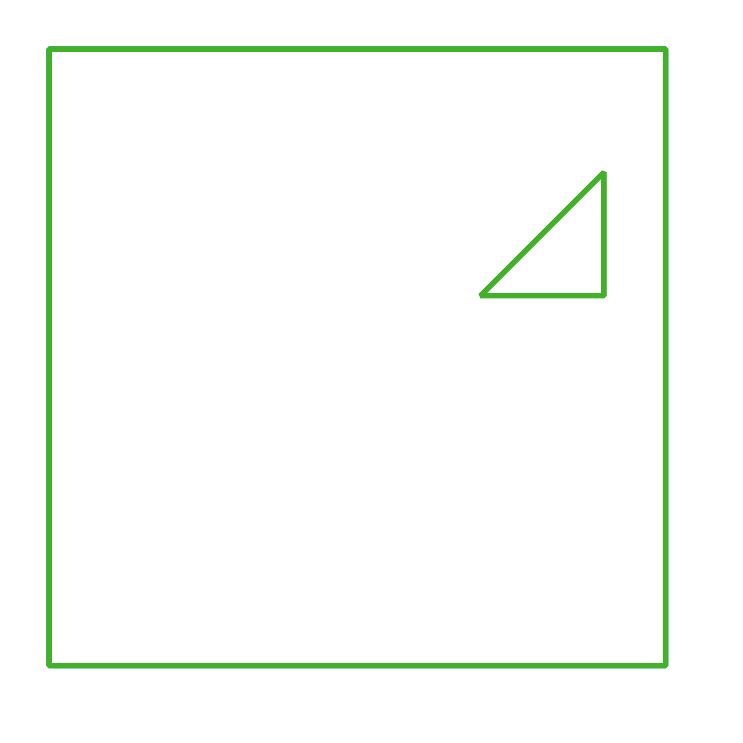
1. Add these auxiliary points and lines to create 2 right triangles: Label the origin . Plot points and . Draw segments  and .
2. How do triangles and compare? How do you know?
3. What must be true about the ratio ?

### 3.2: Congruent, Similar, Neither?

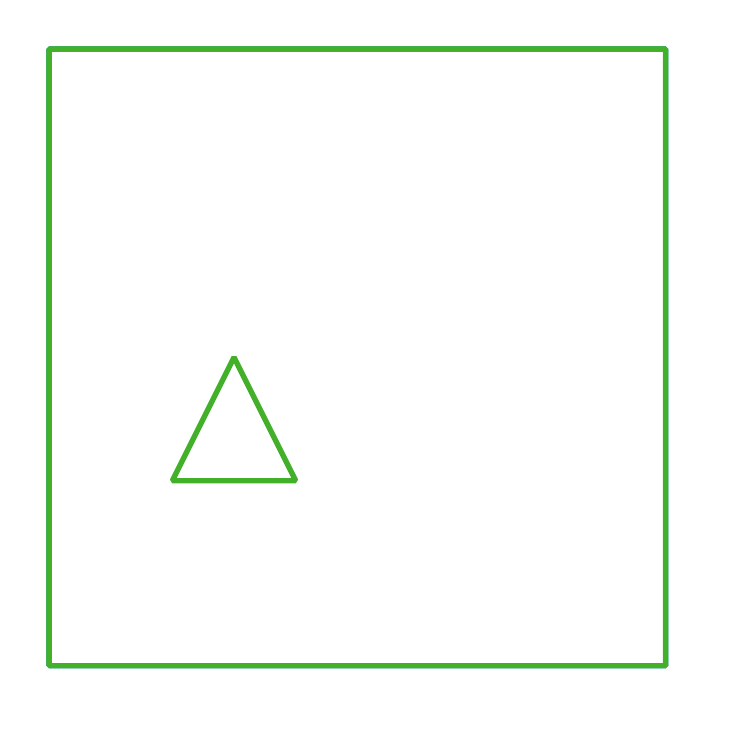
Match each image to its rule. Then, for each rule, decide whether it takes the original figure to a congruent figure, a similar figure, or neither. Explain or show your reasoning.

A

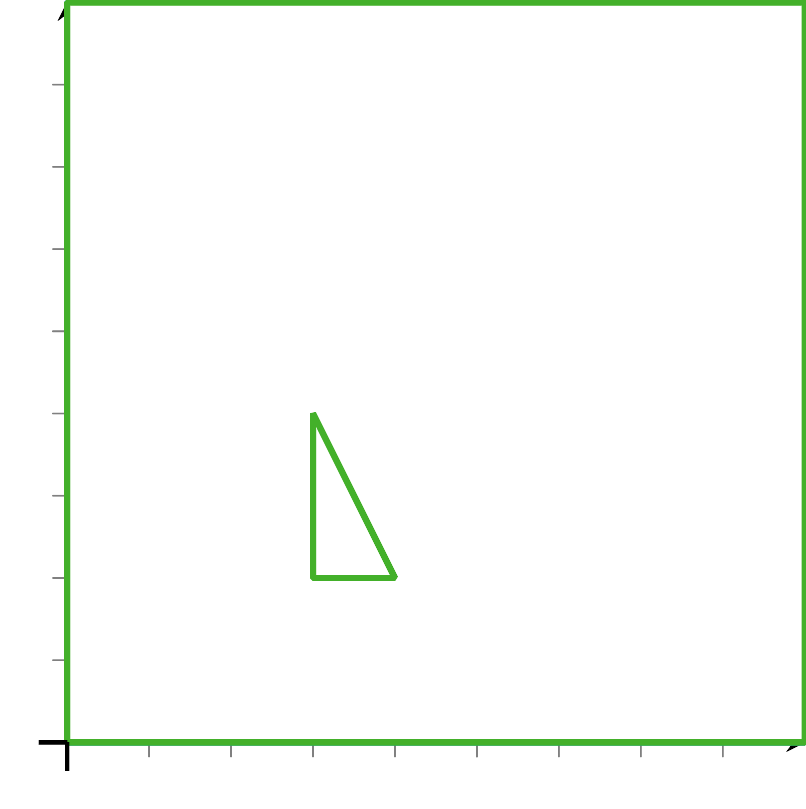


B

C

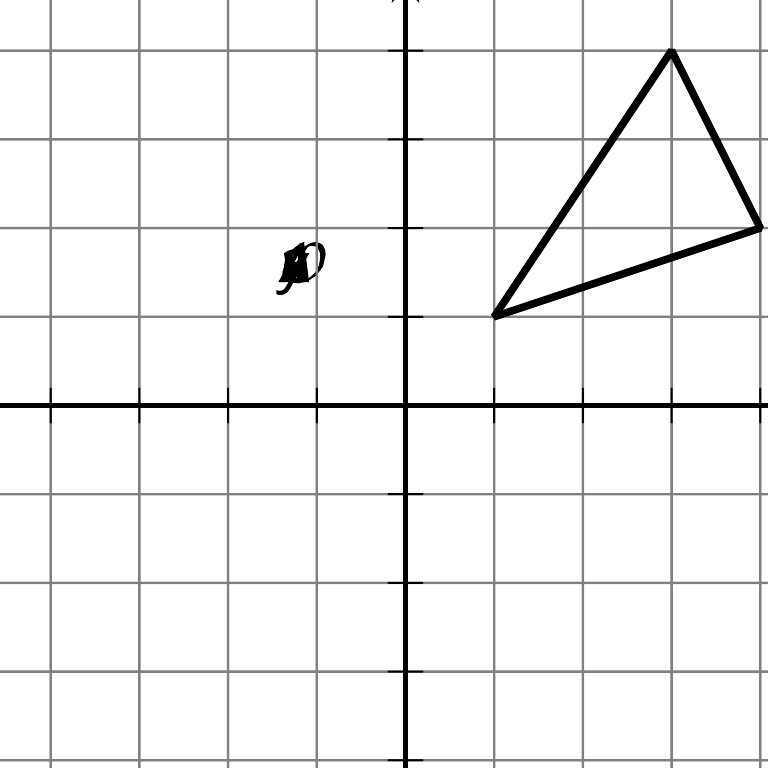


D



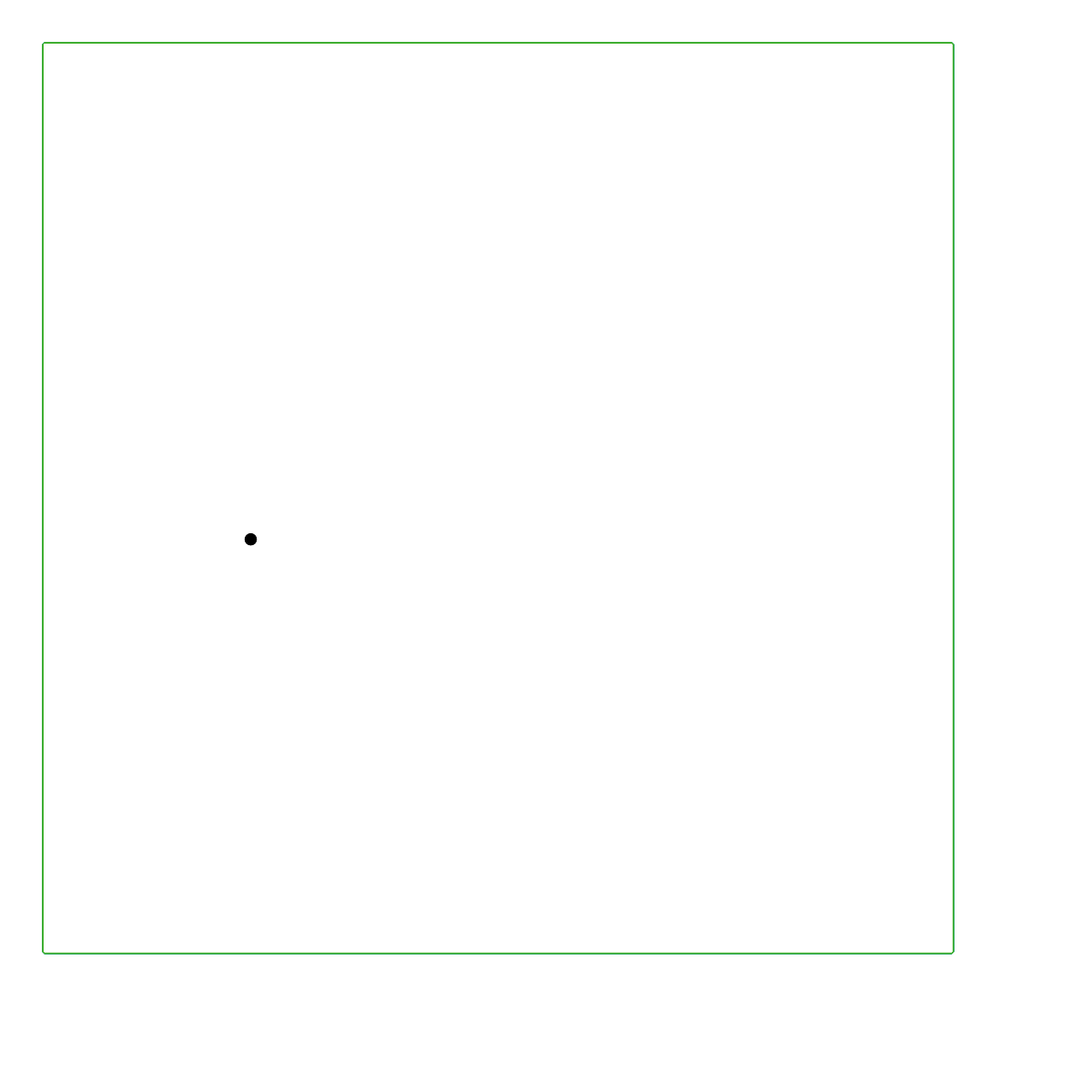
#### Are you ready for more?

Here is triangle .



1. Reflect triangle across the line .
2. Write a single rule that reflects triangle across the line .

### 3.3: You Write the Rules

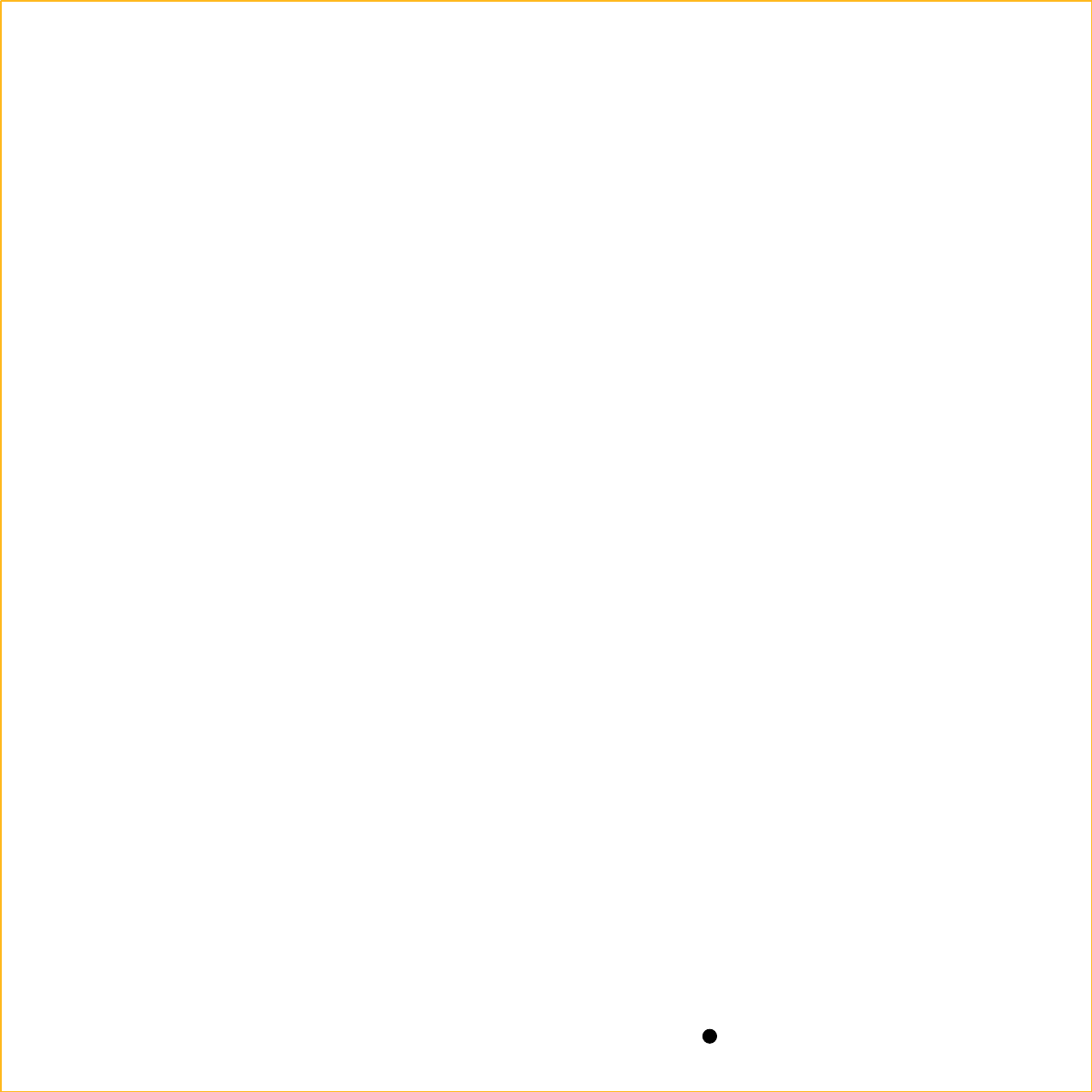


1. Write a rule that will transform triangle to triangle .
2. Are and congruent? Similar? Neither? Explain how you know.
3. Write a rule that will transform triangle to triangle .
4. Are and congruent? Similar? Neither? Explain how you know.

### Lesson 3 Summary

Triangle has been transformed in two different ways:

* , resulting in triangle
* , resulting in triangle



Let’s analyze the effects of the first transformation. If we calculate the lengths of all the sides, we find that segments and each measure units, and each measure 5 units, and and each measure units. The triangles are congruent by the Side-Side-Side Triangle Congruence Theorem. That is, this transformation leaves the lengths and angles in the triangle the same—it is a rigid transformation.

Not all transformations keep lengths or angles the same. Compare triangles and . Angle is larger than angle . All of the side lengths of are larger than their corresponding sides. The transformation stretches the points on the triangle 3 times farther away from the -axis. This is not a rigid transformation. It is also not a dilation since the corresponding angles are not congruent.



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