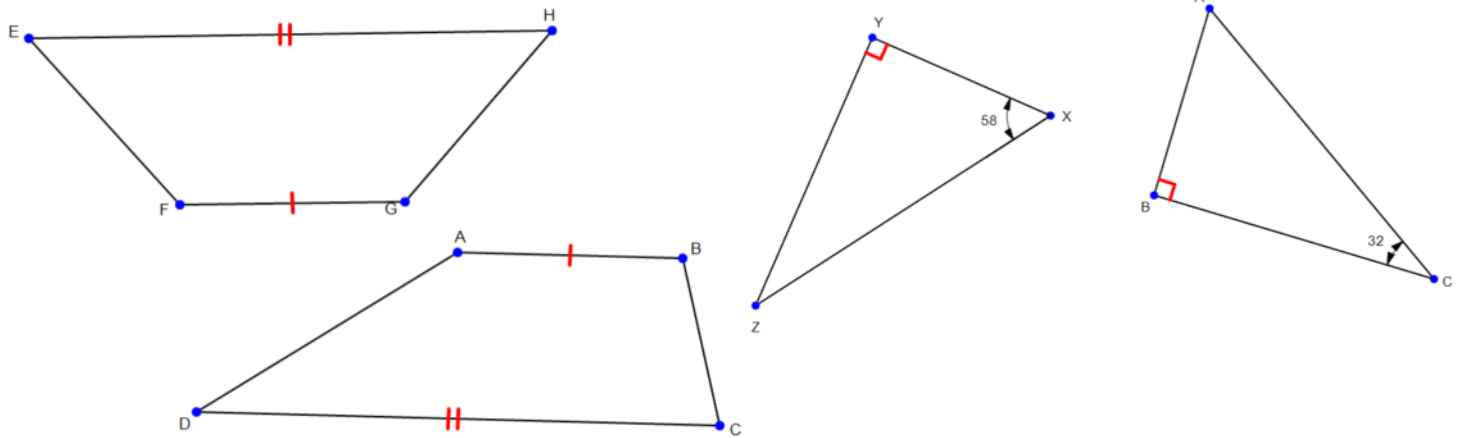# Warm Up

Are the following objects congruent or similar or neither?

Essential Question

What makes a transformation a similarity transformation? What is the relationship between a preimage and the image resulting from a similarity transformation?
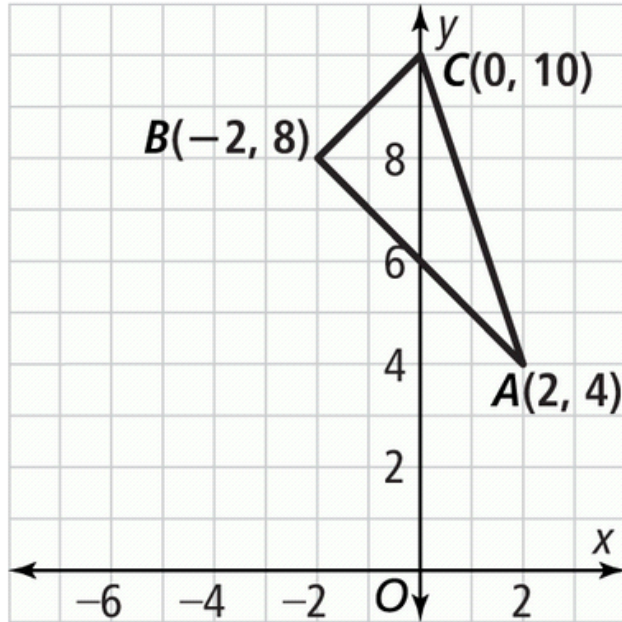
Needed Vocab:
► **Similarity Transformation**

Goal: "I can. . .
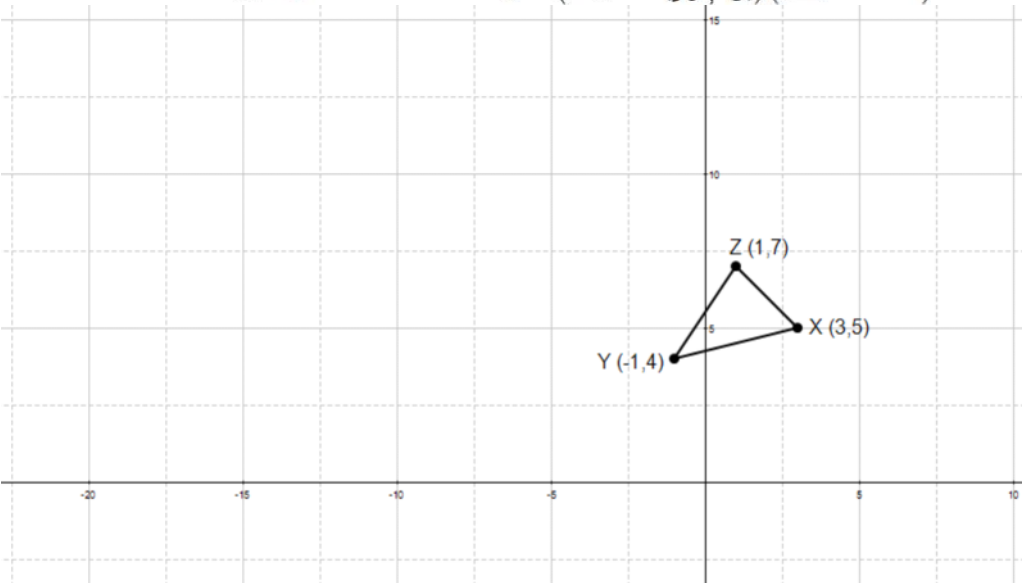**Determine whether figures are similar."**

Example 1

If line m is represented by the equation $x = -3$, what is a graph of the image $(R_m \circ D_{0.5})(\triangle ABC)$?

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1. The vertices of $\triangle XYZ$ are $X(3, 5)$, $Y(-1, 4)$, and $Z(1, 7)$.

a. What is the graph of the image $(D_2 \circ T_{\langle 1, -2 \rangle})(\triangle XYZ)$?

b. What is the graph of the image $(D_3 \circ r_{(90°, O)})(\triangle XYZ)$?
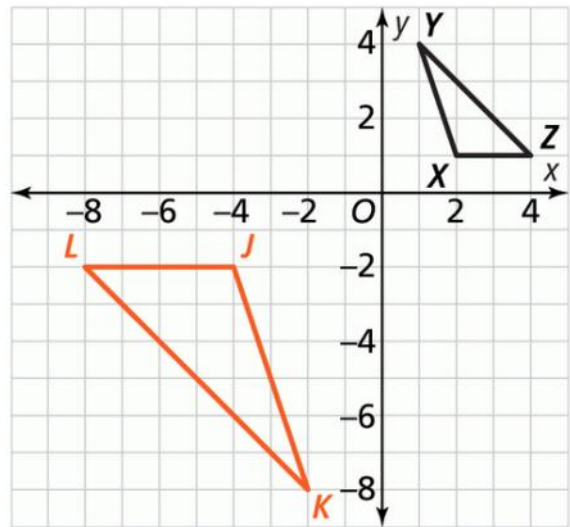

EXAMPLE 2

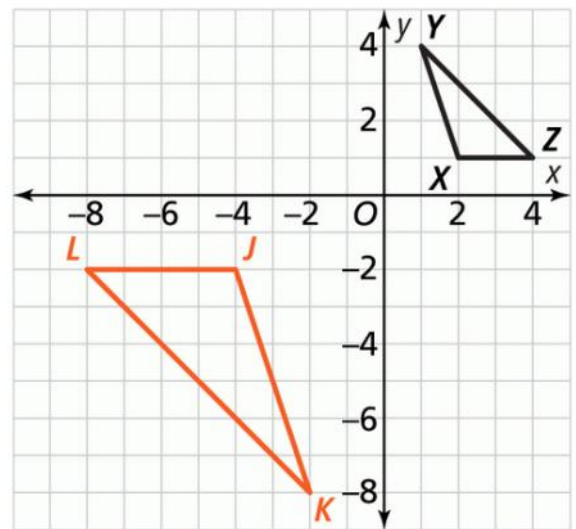Is there a composition of transformations that maps $\triangle XYZ$ to $\triangle JKL$? Explain.
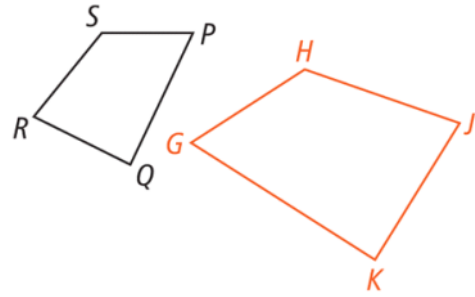
Explain.

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2. Triangle *XYZ* can be rotated $180°$ and then dilated by a scale factor of 2 to obtain $\triangle JKL$. If these transformations are performed in the reverse order, are the results the same? Do you think your answer holds for all compositions of transformations? Explain.
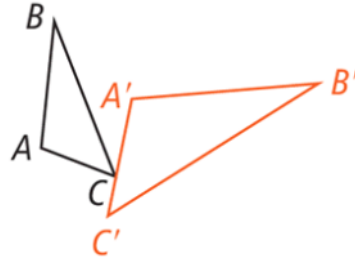

EXAMPLE 3

Why is *PQRS* similar to *GKJH*?

A **similarity transformation** is a composition of one or more rigid motions and a dilation. A similarity transformation results in an image that is similar to the preimage.

Describe a possible similarity transformation for the pair of similar figures shown, and then write a similarity statement.

EXAMPLE 4

Can the artist copy her sketch to cover an entire wall measuring 15 ft high by 20 ft wide so her wall mural is similar to her sketch? Explain.

11 in.

Can the artist copy her sketch to cover an entire wall measuring 15 ft high by 20 ft wide so her wall mural is similar to her sketch? Explain.
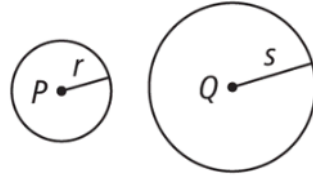

11 in.
14 in.

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4. Suppose the artist cuts 2 inches from the width of her sketch. How much would she cut from the height so she can copy a similar image to cover the wall?

11 in.
14 in.

EXAMPLE 5

Given: ⊙P with radius r, ⊙Q with radius s

Prove: ⊙$P \sim$ ⊙Q

5. Write a proof that any two squares are similar.

https://tinyurl.com/wpo744e

Homework

Pg. 315
9, 15, 17, 19, 23, 28