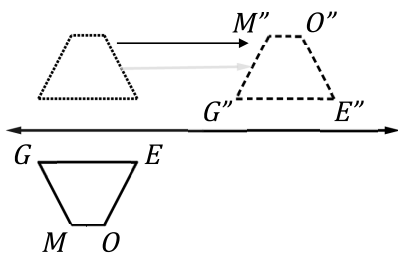
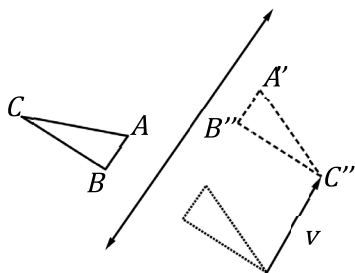


Section 5 – Topic 1
Compositions of Transformations of Polygons – Part 1

What do you think **composition of transformations** means?

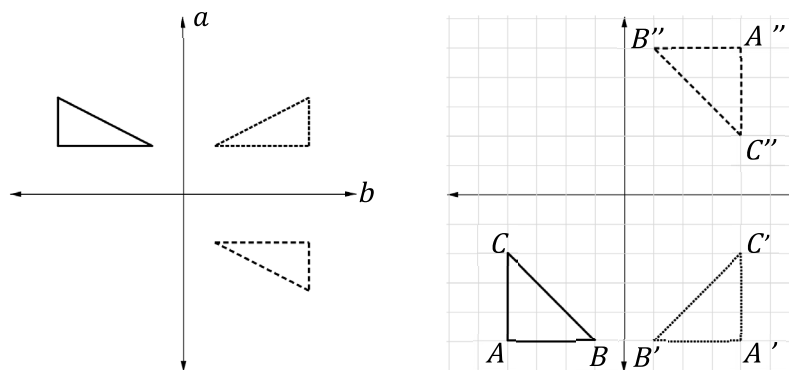
Identify and describe a real-life example.

Consider the following **glide reflections**.



What do you notice about the glide reflections?

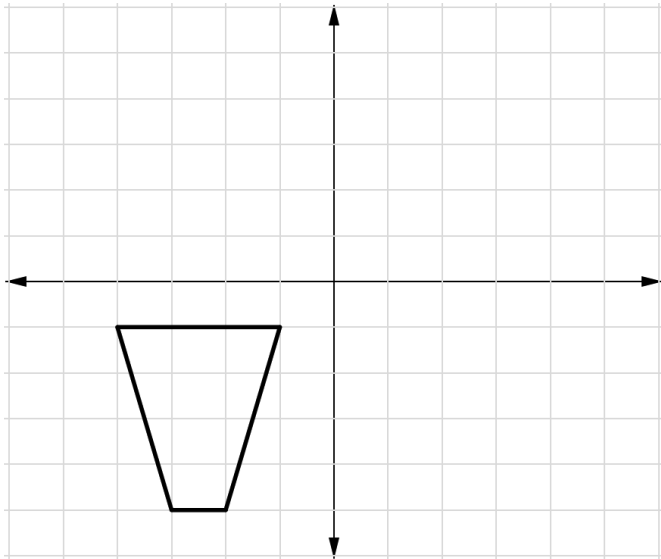
Consider the following **double reflections**.



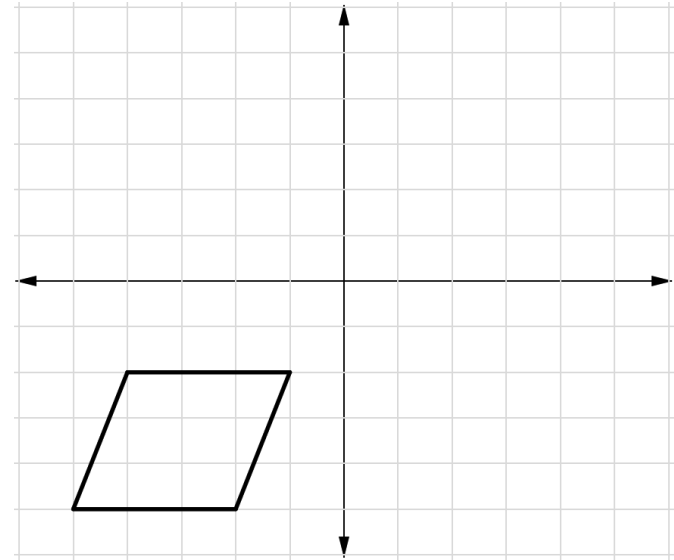
What do you notice about the double reflections?

What is a **composition of isometries**?

Consider the following figure that represents a composition of isometries below. Reflect the figure over $x = 1$, then rotate the figure 270° clockwise about the origin.

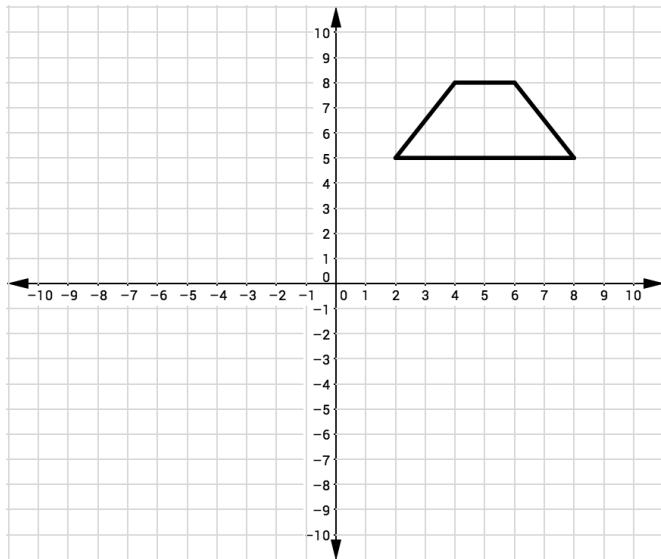


Consider the following figure to represent other compositions below. Dilate the figure at the origin with a scale factor of $\frac{1}{2}$ and then reflect the figure over $y = -x$.



Is this a composition of isometries? Justify your answer.

Consider the figure below.



If you are limited by three transformations, describe what type(s) of transformations or compositions will carry the polygon to itself.

Section 5 – Topic 2

Compositions of Transformations of Polygons – Part 2

Let's Practice!

- Consider the following information.

A pre-image of $SPOT$ with coordinates
 $S(7, 2), P(0, 9), O(-6, -5), T(1, -12)$

- If we reflect $SPOT$ over the x – axis then rotate it 90° counterclockwise about the origin, what are the coordinates of $S''P''O''T''$? Write each answer in the space provided below.

$$S(7, 2) \rightarrow S'(\underline{\quad}, \underline{\quad}) \rightarrow S''(\underline{\quad}, \underline{\quad})$$

$$P(0, 9) \rightarrow P'(\underline{\quad}, \underline{\quad}) \rightarrow P''(\underline{\quad}, \underline{\quad})$$

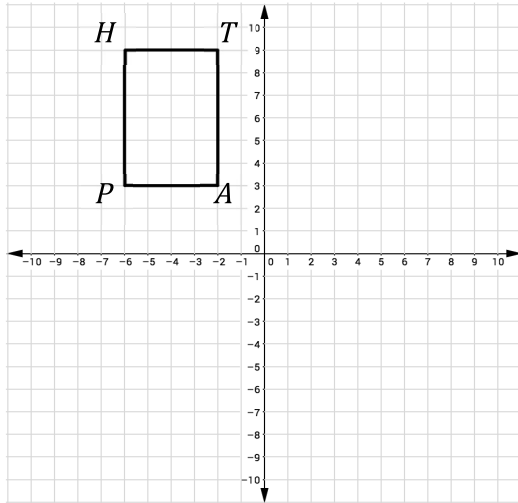
$$O(-6, -5) \rightarrow O'(\underline{\quad}, \underline{\quad}) \rightarrow O''(\underline{\quad}, \underline{\quad})$$

$$T(1, -12) \rightarrow T'(\underline{\quad}, \underline{\quad}) \rightarrow T''(\underline{\quad}, \underline{\quad})$$

- If you take $S''P''O''T''$ and dilate it by a scale factor of 3 centered at the origin, what are the coordinates of $S'''P'''O'''T'''$? Justify your answer.

Try It!

2. Consider the figure below and the following rotation. Rectangle $PATH$ is rotated 270° counterclockwise around the origin and then reflected across the $y - axis$.



Tatum argues that the image created above will be the same as the pre-image. Marla refutes the answer by arguing that the images will not be the same. Who is correct? Justify your answer.

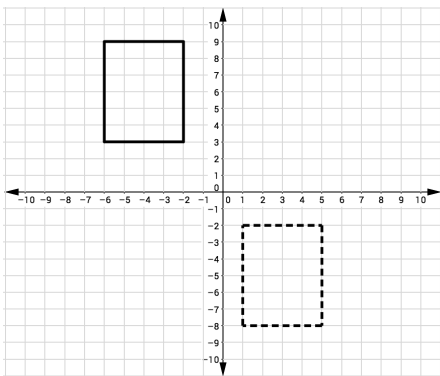
BEAT THE TEST!

1. Point $P''(-9,0)$ is a vertex of triangle $P''I''E''$. The original image was rotated 90° clockwise and then translated $(x,y) \rightarrow (x - 8,y + 5)$. What are the coordinates of the original image's point P before the composition of transformations?

- (A) $(-1, -5)$
- (B) $(0, -4)$
- (C) $(1, -5)$
- (D) $(5, -1)$



2. Consider the following polygon after a composition of transformations represented by the dashed lines below.



Which composition of isometries did the polygon have?

- Ⓐ A reflection over the x -axis and a translation $(x + 7, y + 1)$.
- Ⓑ A reflection over $y = 1$ and a translation $(x + 7, y)$.
- Ⓒ A translation $(x + 8, y - 3)$ and a rotation of 90° clockwise about $(1, 1)$.
- Ⓓ A translation $(x + 10, y)$ and a reflection over $y = -x$.