

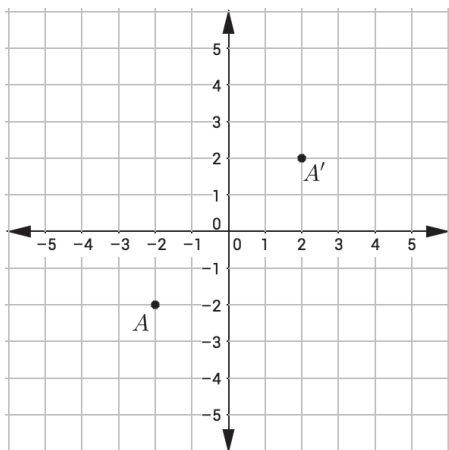
Section 2 – Topic 1 Introduction to Transformations

What do you think happens when you transform a figure?

What are some different ways that you can transform a figure?

- In geometry, **transformations** refer to the _____ of objects on a coordinate plane.
- A **pre-figure** or **pre-image** is the original object.
- The **prime notation** ['] is used to represent a transformed figure of the original figure.

Consider the graph below, circle the pre-image and box the transformed image. Describe the transformation.



There are two main categories of transformations: **rigid** and **non-rigid**.

- A _____ transformation changes the size of the pre-image.
- A _____ transformation does not change the size of the pre-image.

Write a real-world example of a rigid transformation.

Write a real-world example of a non-rigid transformation.

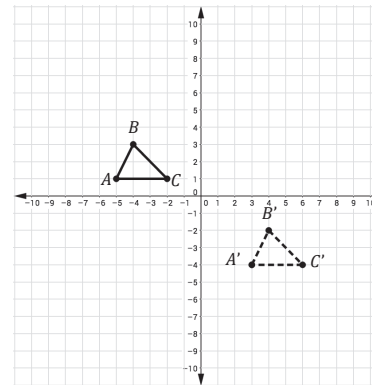
There are four common types of transformations:

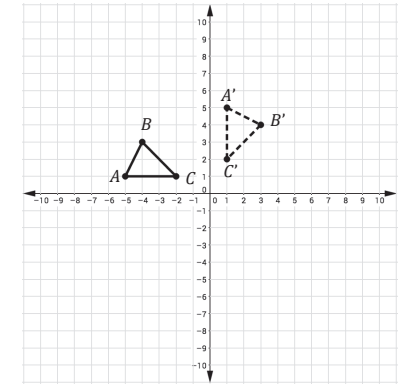
- A **rotation** turns the shape around a center point.
- A **translation** slides the shape in any direction.
- A **dilation** changes the size of an object through an enlargement or a reduction.
- A **reflection** flips the object over a line (as in a mirror image).

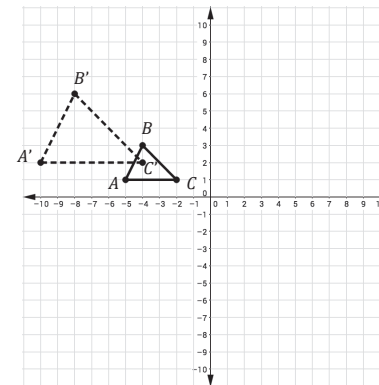
In the table below, indicate whether the transformation is rigid or non-rigid and justify your answer.

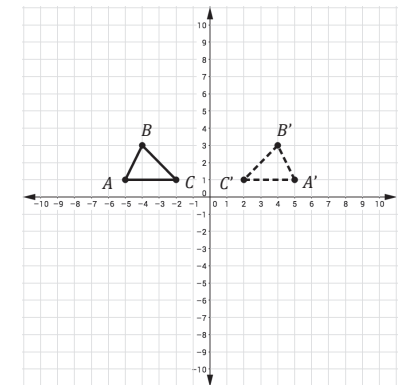
Transformation	Rigid/Non-Rigid	Justification
Translation	<input type="radio"/> Rigid <input type="radio"/> Non-Rigid	
Reflection	<input type="radio"/> Rigid <input type="radio"/> Non-Rigid	
Rotation	<input type="radio"/> Rigid <input type="radio"/> Non-Rigid	
Dilation	<input type="radio"/> Rigid <input type="radio"/> Non-Rigid	

Now, identify the transformations shown in the following graphs and write the names of the transformations in the corresponding boxes under each graph.





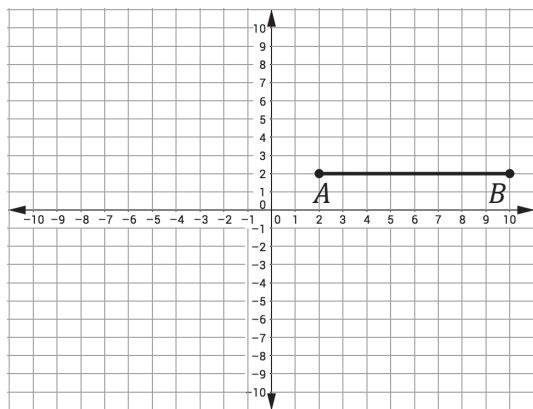






Let's Practice!

- Consider \overline{AB} in the coordinate plane below.
 - Write the coordinates of each endpoint, the length of the segment, and the midpoint of the segment.



A (____, ____)

B (____, ____)

Length: ____ units

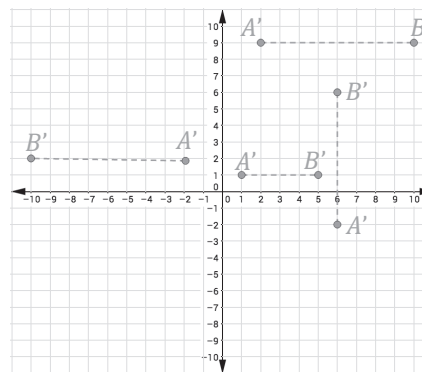
Midpoint: (____, ____)

- Write the coordinates of A' and B' after the following transformations.

Transformations	A'	B'
\overline{AB} is translated 5 units up and 3 units to the left.		
\overline{AB} is rotated 180° clockwise about the origin.		

Try It!

- Consider the transformations of \overline{AB} in the previous problem.
 - Trace the lines and identify the transformations on the graph.

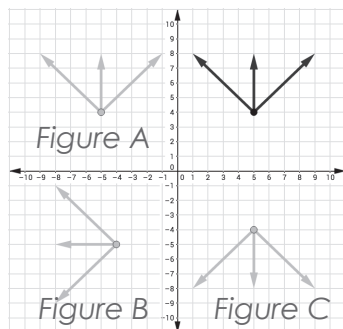


- What are the A' and B' coordinates in each transformation below? What are the length and midpoint of each segment indicated in the chart?

Transformation	Coordinates	Length	Midpoint
Translation	A' (____, ____); B' (____, ____)		
Dilation	A' (____, ____); B' (____, ____)		
Rotation	A' (____, ____); B' (____, ____)		
Reflection	A' (____, ____); B' (____, ____)		

BEAT THE TEST!

1. Three rays share the same vertex $(5, 4)$ as shown in the coordinate plane below.



Part A: Which figure represents a reflection across the y -axis?

Part B: Which of the following statements are true about the figure? Select all that apply.

- A rotation of 360° will carry the object onto itself.
- A reflection of the figure along the x -axis carries the figure to Quadrant II.
- In Figure A, $(x', y') = (x + 10, y)$.
- If the vertex of Figure A is translated $(x + 1, y - 9)$, it will carry onto the vertex of Figure B.
- Figure C is a reflection on the x -axis of Figure A.

