Module 2 Test – Study Guide

CONCEPTS TO KNOW:			
	Transformation (types)	**Rigid v. Non-Rigid Motion**	**Coordinate Notation**
	Vector Terminology	**Pre-Image v. Image**	**Vertex**
	Prime Notation	**Equation of a Line**	**Lines of Symmetry**
	Rotational Symmetry	**Angle (or Degree) of Rotational Symmetry**	

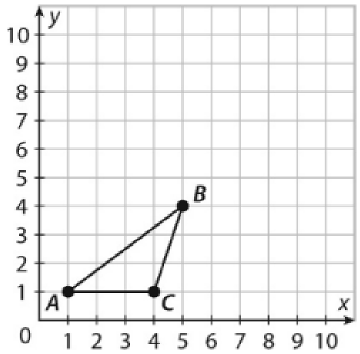
Part 1 – Fill in the blanks (the first one is already complete) – use graph paper to explore.

Coordinate Rule	Type of Transformation *(translation, reflection, rotation, or none-of-the-above)*. Be as specific as possible.	Rigid or Non-Rigid? Explain briefly how you know.
Example: (x,y) **→ (x + 1, y + 2)**	**Translation – one to the right and two up**	**Rigid – a translation only changes position, not shape or size.**
(x,y) → (x - 1, y + 5)		
(x,y) → (-x, y)		
(x,y) → (x, -y)		
(x,y) → (-x, -y)		
(x,y) → (y, x)		
(x,y) → (-y, -x)		
(x,y) → (-y, x)		
(x,y) → (1/2x, 1/2y)		
(x,y) → (x, 1/2y)		
(x,y) → (3x, 3y)		
(x,y) → (-x, y + 2)	*Hint – this is two transformations!*	

Part 2 – Translations and Reflections

For 1–2 use the graph.

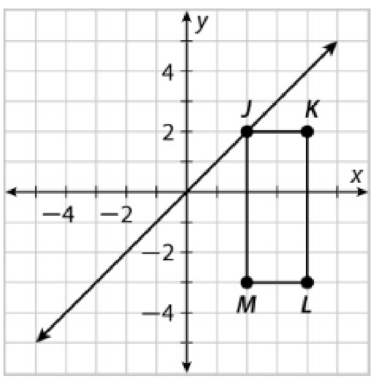
Triangle *ABC* will be translated 3 units right and 6 units up.



1. Write a coordinate rule to describe the translation.

____

2. What will be the coordinates of the image of point *A*?



3. Rectangle *JKLM* has vertices *J*(2, 2), *K*(4, 2), *L*(4, –3), and *M*(2, –3). If the rectangle is reflected across the line $y = x$, what are the vertices of the reflected image?

A *J′*(2, 2), *K′*(2, 4), *L′*(–3, –4), *M′*(–3, 2)

B *J′*(2, 2), *K′*(2, 4), *L′*(–3, 4), *M′*(–3, 2)

C *J′*(2, 2), *K′*(2, 4), *L′*(3, 4), *M′*(3, 2)

---

4. Look at the following transformation:

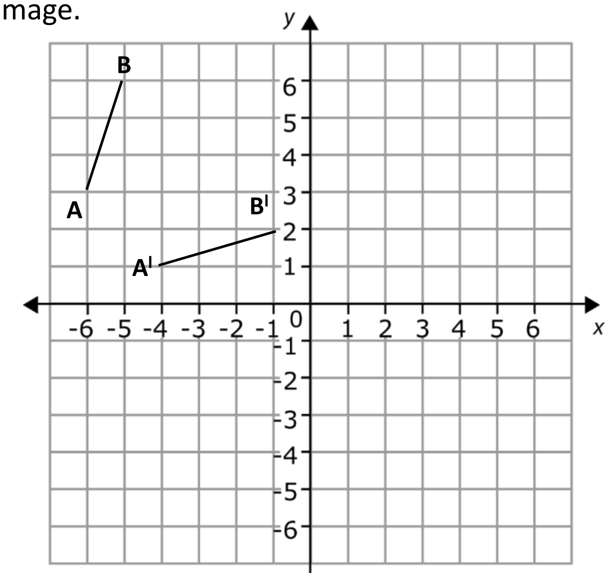
ΔABC maps to triangle $\Delta A'B'C'$.

Preimage		**Image**
A(–4, 3)	→	*A′*(4, 3)
B(–3, –3)	→	*B′*(3, –3)
C(1, 2)	→	*C′*(–1, 2)

What is the coordinate rule for this transformation?

What type of transformation is this?

5. The two segments on the coordinate plane below represent a pre-image and it's reflected image.



a. How can the line of reflection be determined?

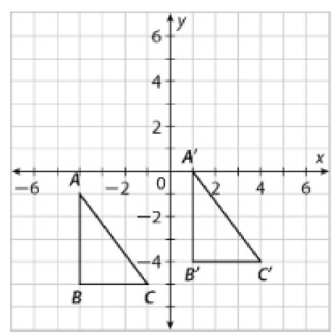
____

____

b. Use this information to draw the line of reflection on the coordinate plane.

---

6. What is the vector form of the translation that maps ΔABC to $\Delta A'B'C'$?



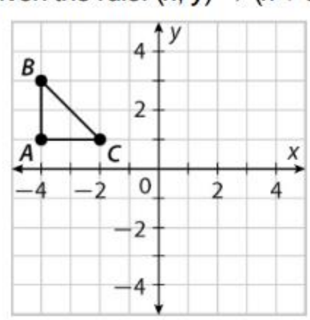
A $\langle 1, 5\rangle$

B $\langle 5, 1\rangle$

C $\langle -1, 5\rangle$

---

7. a. Draw the transformation of ΔABC given the rule: $(x, y) \to (x + 6, y)$.



b. Describe the transformation.

____

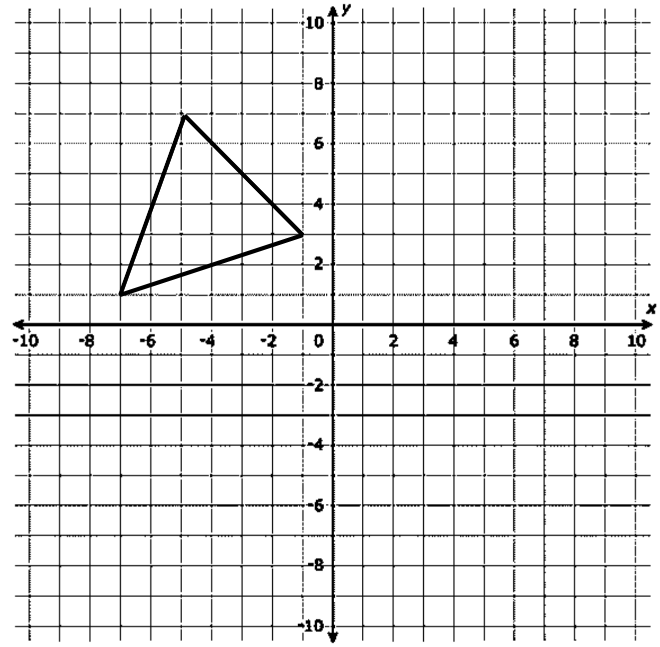
Part 3 – Reflection Practice: Graphing lines of reflection.

Graph the image of the triangle after it is reflected over the line y = x.

<u>Step 1 – Draw the line of reflection.</u> Carefully graph the line y = x. If you don't remember what this line looks like, make a quick table using two easy x-values, and plug into the equation of the line y = x.

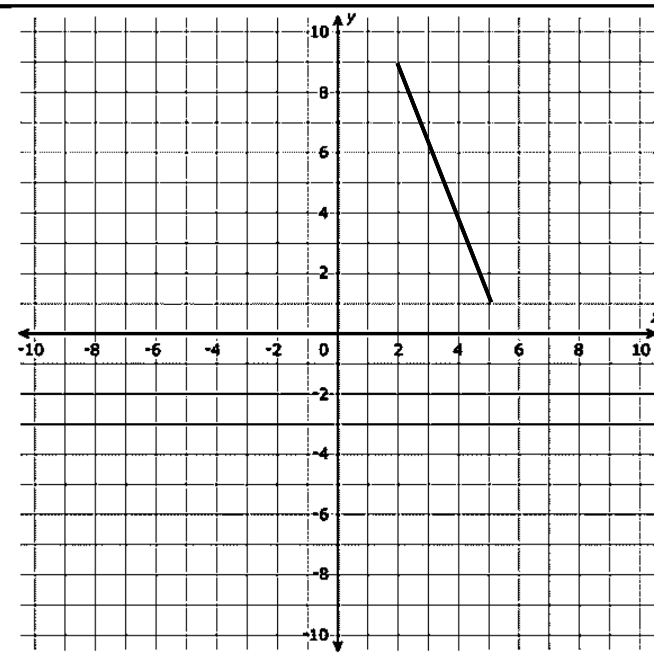
<u>Step 2 – Reflect the pre-image one vertex at a time.</u> Techniques could either involve folding the paper CAREFULLY along the line of reflection and poking a whole through each vertex, or reflecting each vertex exactly the same distance away from the line of reflection in the opposite direction, at a 90° angle to the line of reflection. Turn the paper so the line of reflection is either vertical or horizontal to help with visualization. You can also use the coordinate rule if you have it memorized.

X	Y
0	
1	



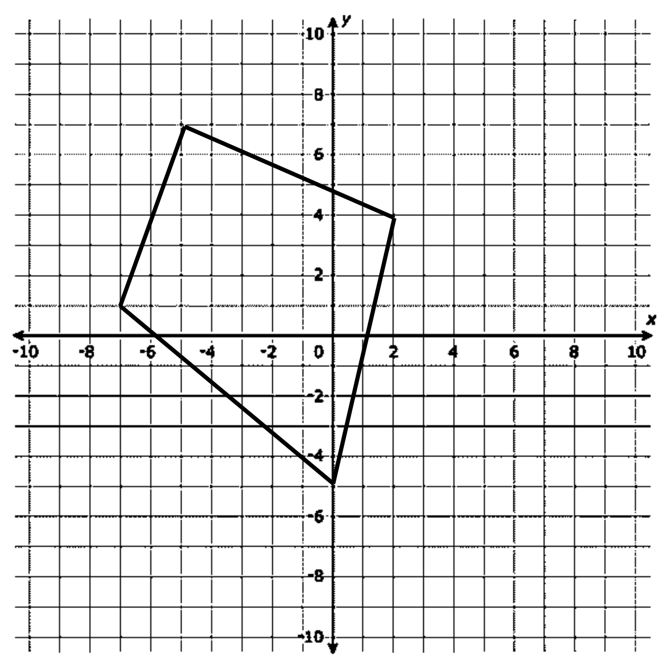
Graph the image of the line after it is reflected over the line y = -x.

X	Y
0	
1	

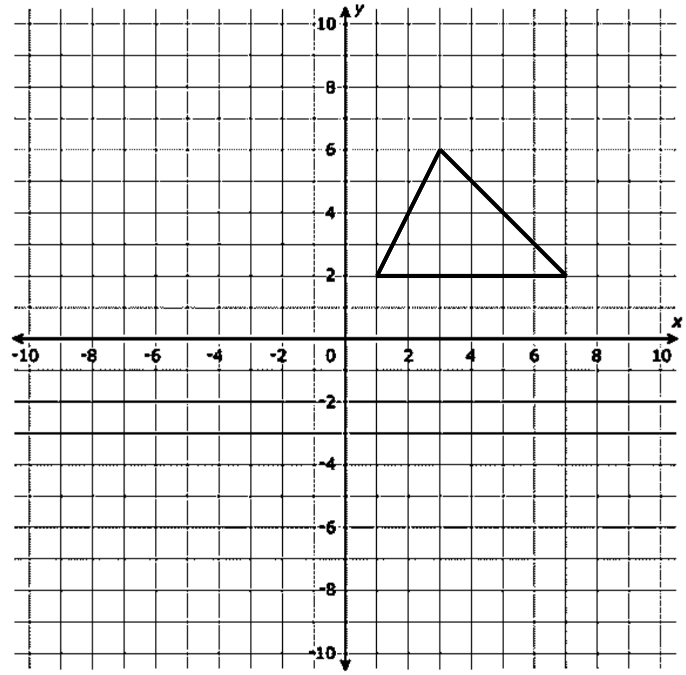


Graph the image of the quadrilateral after it is reflected over the line y = -1

X	Y
0	
1	



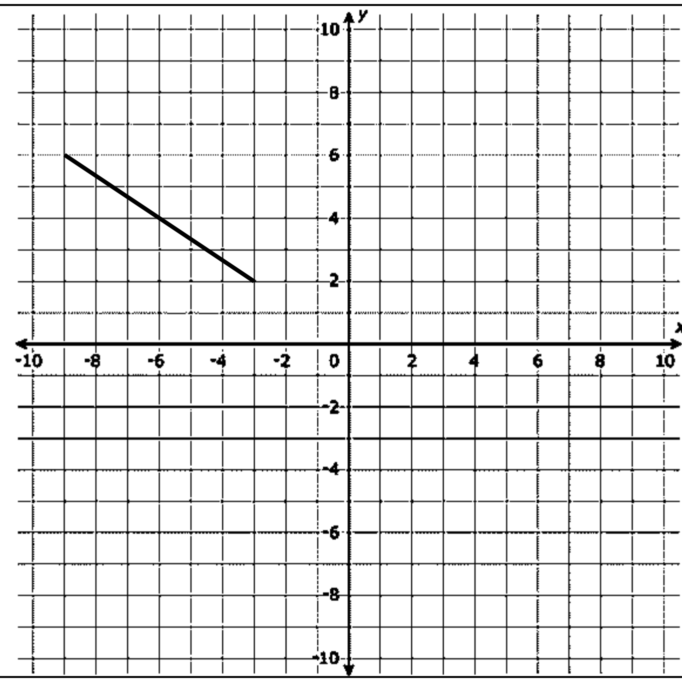
Part 4 – Rotation Practice.



Rotate the triangle 90°, then answer the following questions:

1. What quadrant does the image of the triangle appear? __________________
2. Which direction did you rotate the triangle and why? _________________
3. What degree of rotation would this be equivalent to, and in what direction? _____________________
4. Is this transformation a rigid motion? Why or why not? _______________________________
5. What is the coordinate rule for this transformation?

   ____

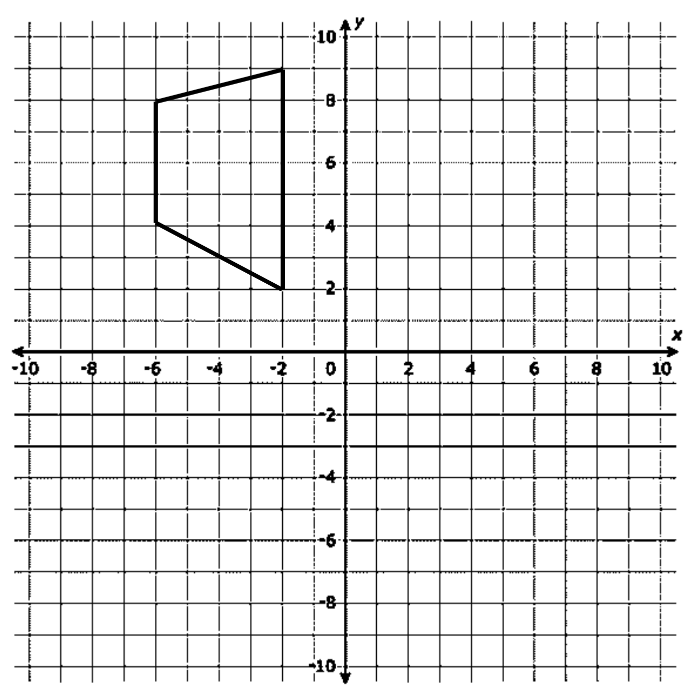


Rotate the segment 180°, then answer the following questions:

1. What quadrant does the image of the segment appear? __________________
2. Does it matter which direction you rotated the segment, why or why not?

   ____
3. What combination of reflections is this rotation equivalent to? ______________________________
4. What is the coordinate rule for this transformation?

   ____



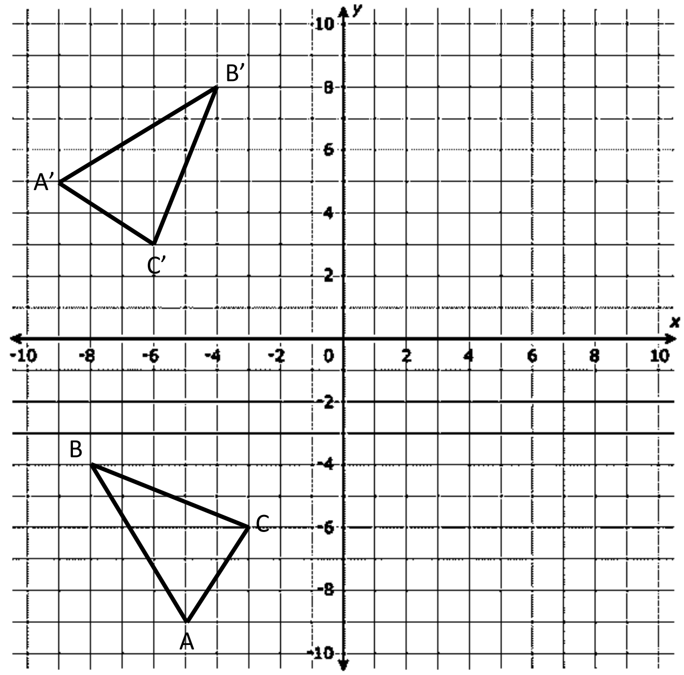
Rotate the trapezoid 90° clockwise, then answer the following questions:

1. What quadrant does the image of the trapezoid appear? __________________
2. What degree of rotation would this be equivalent to, and in what direction? _____________________
3. What is the coordinate rule for this transformation?

   ____

Part 5 – Determining Rotations and Reflections.

The graph to the right contains a pre-image and its image after a certain transformation.

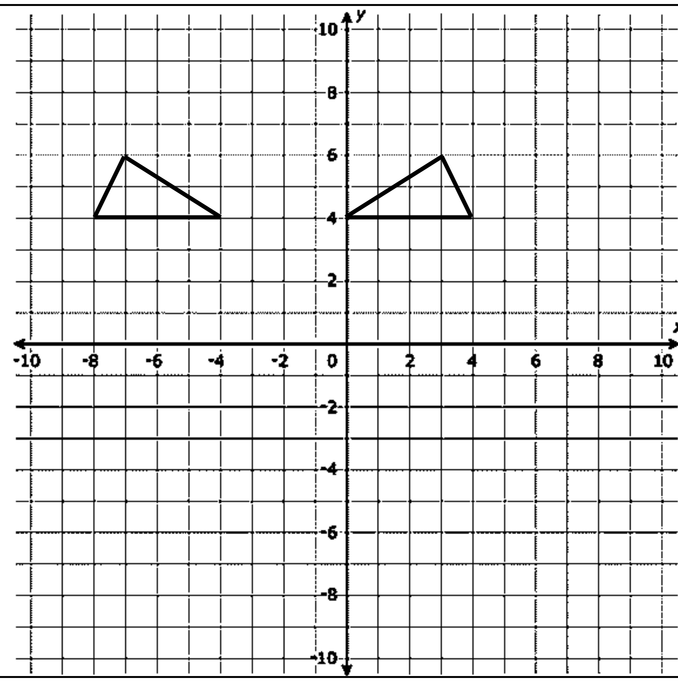


1. Which triangle is the pre-image? How do you know?

2. What type of transformation occurred? If the transformation is a rotation, state the degree and direction. If it is a reflection, draw or state the line of reflection.

3. Was this transformation a rigid motion?

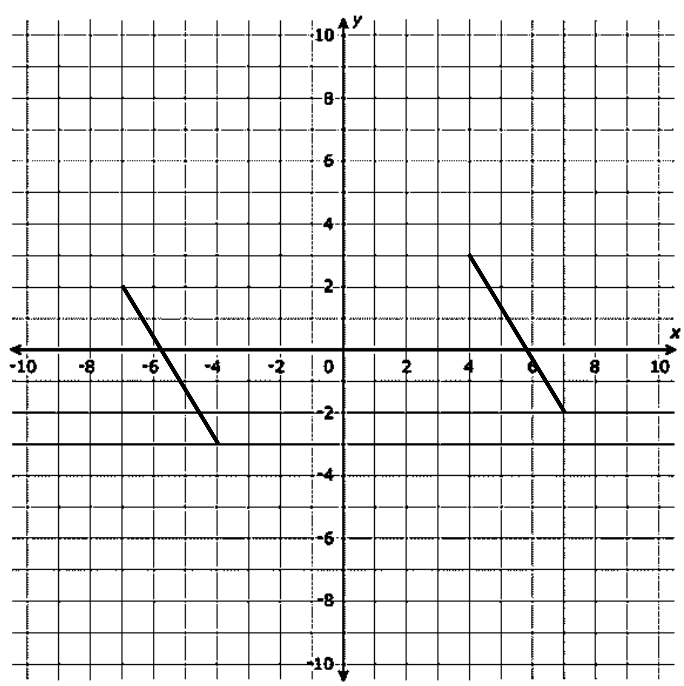
The graph to the right contains a pre-image and its image after a certain transformation.



1. What type of transformation occurred? If the transformation is a rotation, state the degree and direction. If it is a reflection, draw or state the line of reflection.

2. Was this transformation a rigid motion?

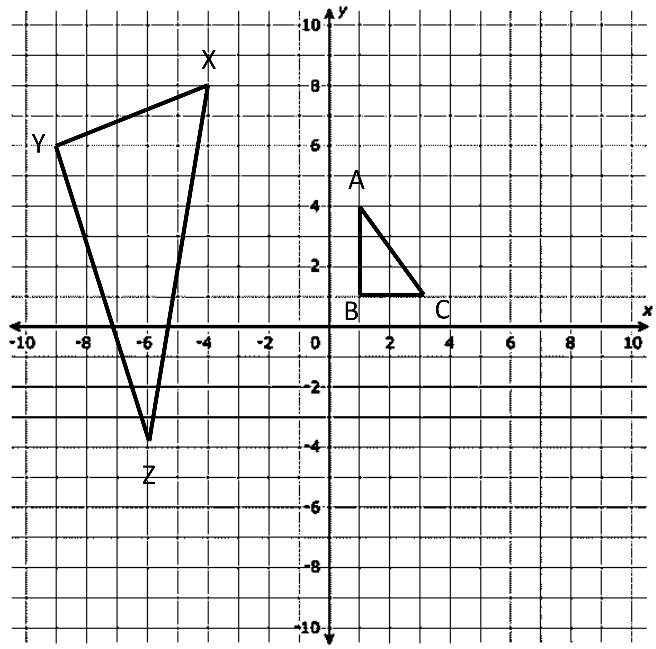
The graph to the right contains a pre-image and its image after a certain transformation.



1. There are 3 different types of transformations that can create this combination of image and pre-image. Can you name all three? (Hint: one of them involves doing the type of transformation twice).

2. Explain why one of these types of transformations only works because this is a line segment and not a polygon.

Part 4 – Dilations, Stretches, and Compressions



1. Use the following coordinate notation to transform shape ABC on the coordinate plane: (x,y) → (2x, 2y)

A(,) → A’(,)
B(,) → B’(,)
C(,) → C’(,)

2. What type of transformation is this? _______________

3. Use the following coordinate notation to transform shape XYZ on the coordinate plane: (x, y) → (x, 1/2y)

X(,) → X’(,)
Y(,) → Y’(,)
Z(,) → Z’(,)

4. What type of transformation is this? _______________

Part 5 – Lines of Symmetry and Degree of Rotational Symmetry

For each figure, draw all of the lines of reflection, and then state the degree of rotational symmetry. If the shape has neither, leave blank.