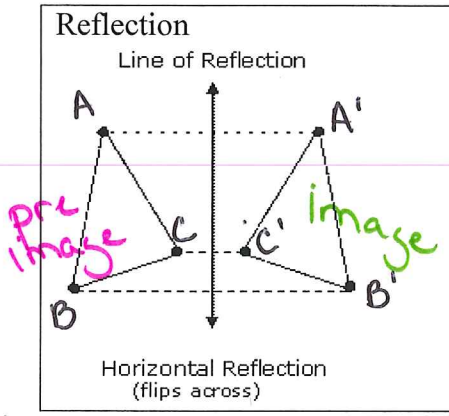
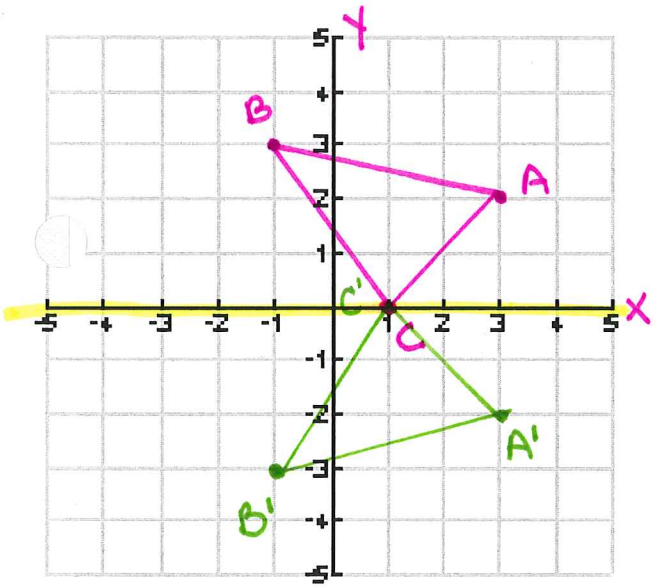
Name:_____ **Geometry Notes: Reflections**

A **reflection** (or *flip*) is an isometry in which a figure and its image have opposite orientations. Thus, a reflected image in a mirror appears "backwards."



- A flip over a line called the line of reflection.
- Each point and its image are the same distance from the line of reflection.
- Possible lines of reflection:
- x - axis or y - axis
- Vertical or horizontal lines in the form x = # or y = #
- Diagonal lines in the form y = x or y = -x

★Draw the pre-image first!



Reflection 1: Reflect the points across the **x-axis:**

Fill out table:

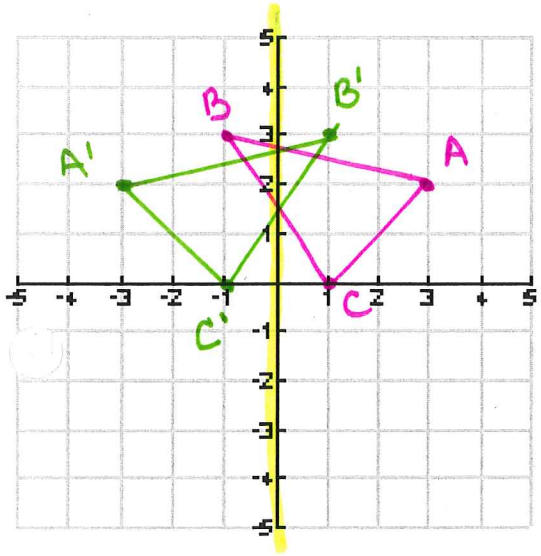
x	y	x'	y'
A (3	2)	A'(3	-2)
B (-1	3)	B'(-1	-3)
C (1	0)	C'(1	0)

What seems to be the rule?
x stay the same, y is opposite

Describe in coordinate mapping notation a translation that will reflect a figure across the x-axis:

(x, y) → (x , -y)

Reflection 2: Reflect the points across the **y-axis:**



Fill out table:

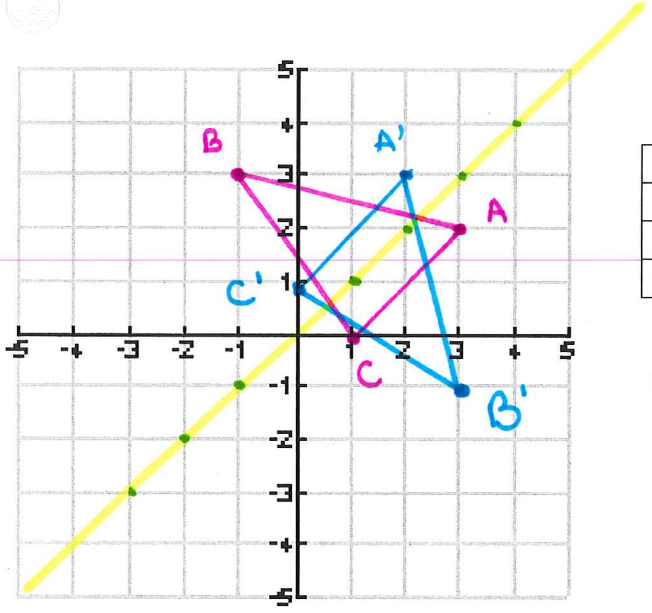
x	y	x'	y'
A (3	2)	A'(-3	2)
B (-1	3)	B'(1	3)
C (1	0)	C'(-1	0)

What seems to be the rule?
x is opposite, y is the same

Describe in coordinate mapping notation a translation that will reflect a figure across the y-axis:

(x, y) → (-x , y)

Reflection 3: Reflect the points across the **line y = x :**



Fill out table:

x	y	x'	y'
A (3	2)	(2	3)
B (-1	3)	(3	-1)
C (1	0)	(0	1)

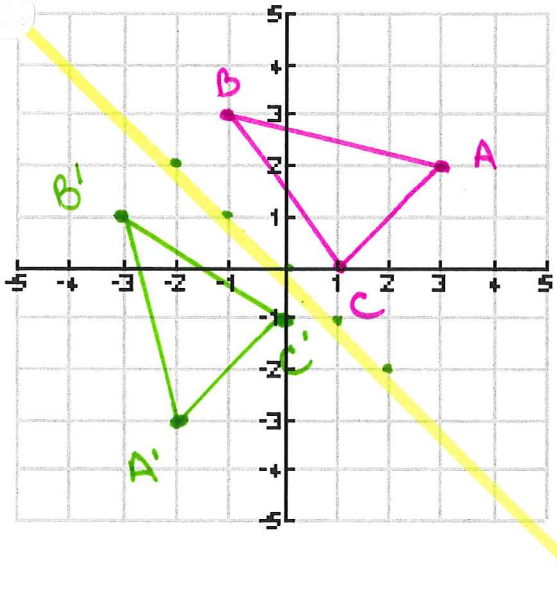
What seems to be the rule?

Switch the x and y

Describe in coordinate mapping notation a translation that will reflect a figure across the line y = x:

(x, y) → (y , x **)**

Reflection 4: Reflect the points across the **line y = -x:**



Fill out table:

x	y	x'	y'
A (3	2)	(-2	-3)
B (-1	3)	(-3	1)
C (1	0)	(0	-1)

What seems to be the rule?

switch x, y then make them opposite

Describe in coordinate mapping notation a translation that will reflect a figure across the line y = -x:

(x, y) → (-y , -x **)**

Let's summarize our results:

Reflection across the x –axis: **(x, y) → (** x , -y **)**

Reflection across the y-axis: **(x, y) → (** -x , y **)**

Reflection across the line y = x : **(x, y) → (** y , x **)**

Reflection across the line y = -x : **(x, y) → (** -y , -x **)**

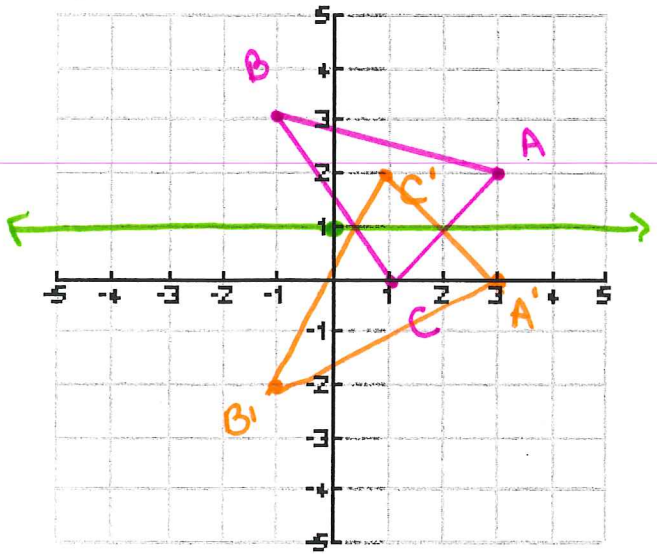
Reflections in vertical or horizontal lines

y = # horizontal

x = # vertical

Reflection 5: Reflect the points across the **line y=1 :**

↖ horizontal, through y = 1



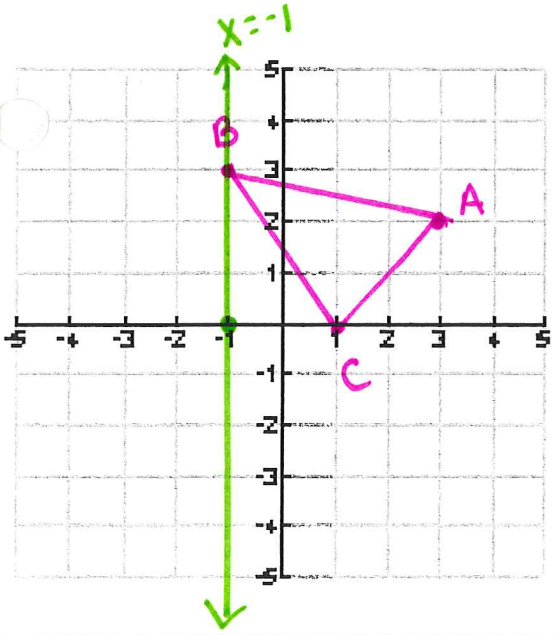
Fill out table:

	x	y	x'	y'
A	(3	2)	(	)
B	(-1	3)	(	)
C	(1	0)	(	)

How do you figure out where the reflected point should be?

count the units from the line of reflection. the image point and pre-image point must be the same distance away

Reflection 6: Reflect the points across the **line x=-1:**



Fill out table:

	x	y	x'	y'
A	(3	2)	(	)
B	(-1	3)	(-1	3)
C	(1	0)	(	)

What happens to the image of point B?

Stays where it is

When would a point not change location?

Try the following reflections WITHOUT graphing!

Pre-image point	Line of reflection	Image point
(4,2)	x-axis	
(5, -1)	y-axis	
(-3, -6)	y=x	
(5,7)	y= -x	