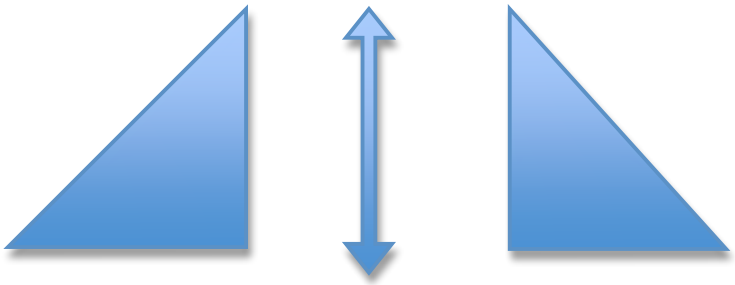
Pre Algebra Name
Reflections

1. Reflections are defined as a **flip** in the coordinate plane.

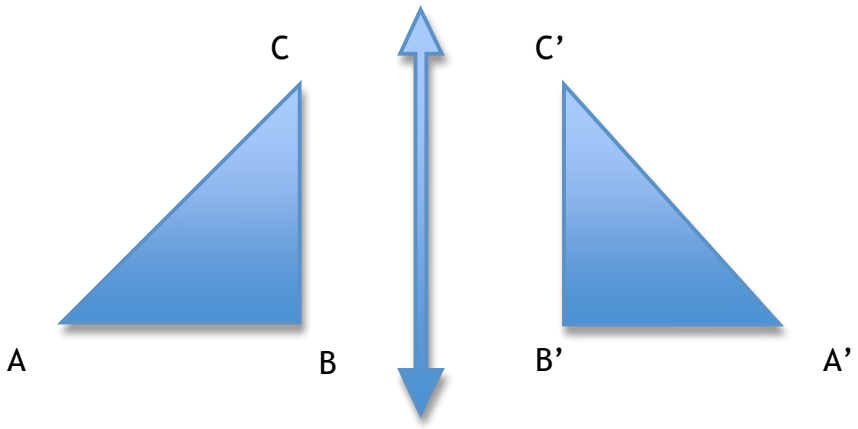
2. It results in a mirror image of the shape **reflected over a line**. For now, the line will be either the x or y axis.



3. The line used to reflect the image is called the **line of reflection**.

4. Size or shape does **not** change. Position in coordinate plane changes.

5. Corresponding points will be the same distance from the line, but on opposite sides. Image is labeled with ‘ marks.



6. Identify line of reflection, count places.

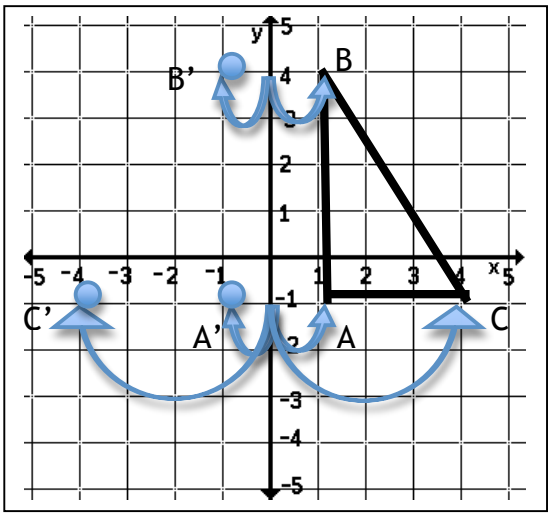
EX: Reflect ΔABC over the y axis.

Original

A (1, -1)

B (1, 4)

C (4, -1)



Image

A' (-1, -1)

B' (-1, 4)

C' (-4, -1)

STEPS TO SOLVE

1) Outline the line of reflection.

2) Pick a point. Count how many units away from the line of reflection it is.

Ex. On the problem above, A is one unit to the right of the y-axis

3) Count that many units on the other side of the line of reflection.

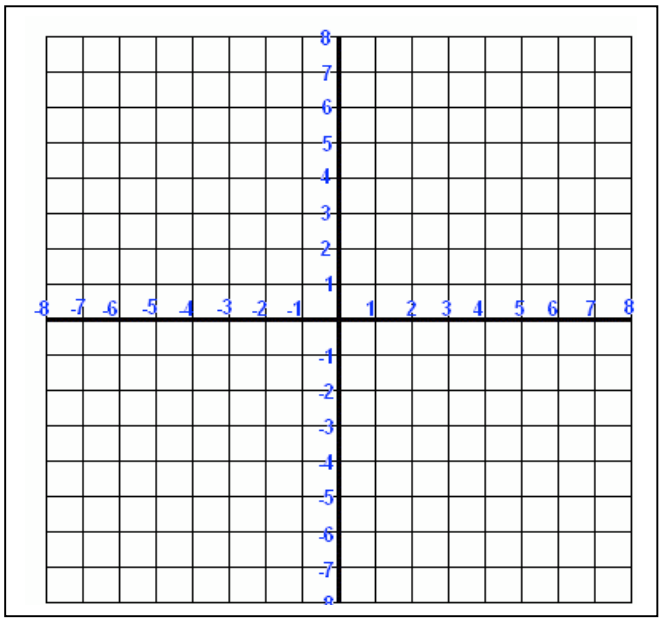
Ex. Using the given information for A we know A' is one unit to the left of the y-axis

4) Put the image there, label with a prime notation mark.

Repeat steps 2-4 for all points and then connect the dots to form the shape

You Try: Draw triangle MPQ with vertices M(-4, 2) P(-1,6) Q(3,2)

Reflect the triangle over the x axis.



Step 1: Outline the line of reflection

Step 2: Pick a point. Count how many units away from the line of reflection it is.

Point _____ is _____ units above the x-axis.

Point _____ is _____ units above the x-axis.

Point _____ is _____ units above the x-axis.

Step 3: Count that many units on the other side of the line of reflection.

Point ____ ‘ is _____ units below the x-axis.

Point ____ ‘ is _____ units below the x-axis.

Point ____ ‘ is _____ units below the x-axis.

Step 4: Put the image there, label with a prime notation mark

Answer the following questions:

1) Did my image flip across the line of reflection?

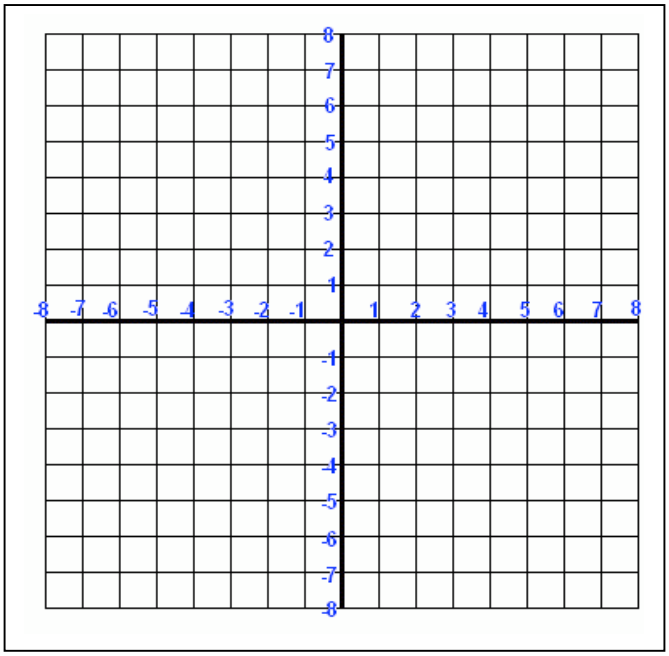
2) Does my new figure look like a mirror image of my original figure?

3) Did the size or shape of my reflection change?

4) Is my new image in a different place then the original?

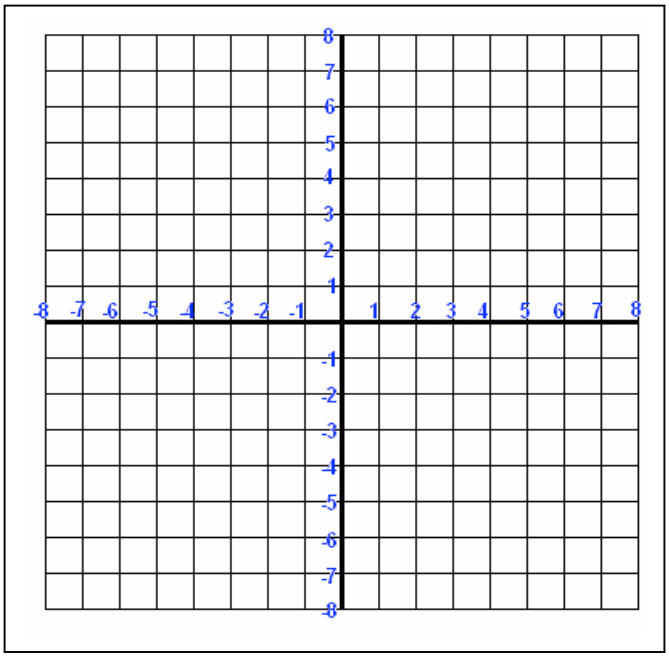
You Try: Draw rectangle GFHJ with vertices G(-6, 7) F(-3,7) H(-3,2) J(-6,2)

Reflect the rectangle over the y axis.



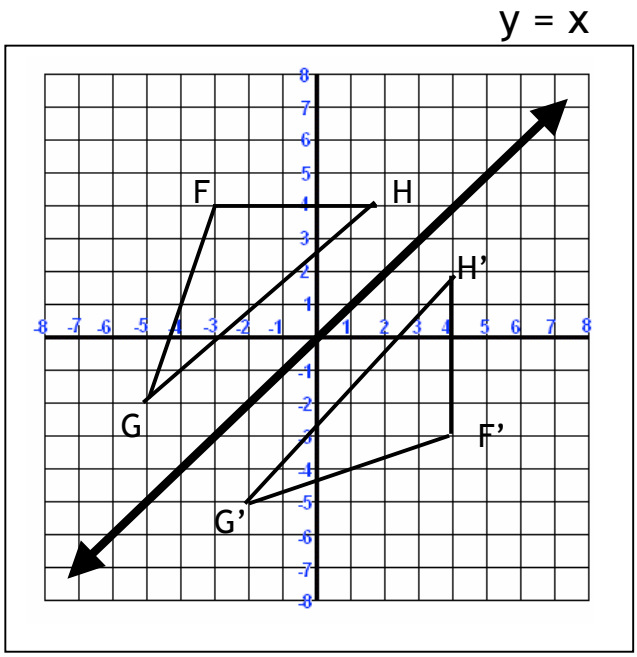
You Try: Draw triangle GFH with vertices G(-6, 7) F(-3,7) H(-3,2)

Reflect the triangle over the x axis.



Reflecting over other lines

Become familiar with this line:



The reflection of (x, y) across the line $y = x$ is the point (y, x)

EX:

(x, y) FLIP! → (y, x)

$(1, 3)$ FLIP! → $(3, 1)$

You try:

1) Reflect the point F(-3 , 4) over the line y=x.

The coordinate of the image is: F'(,)

2) Reflect the point G(-5 , -2) over the line y=x.

The coordinate of the image is: G'(,)

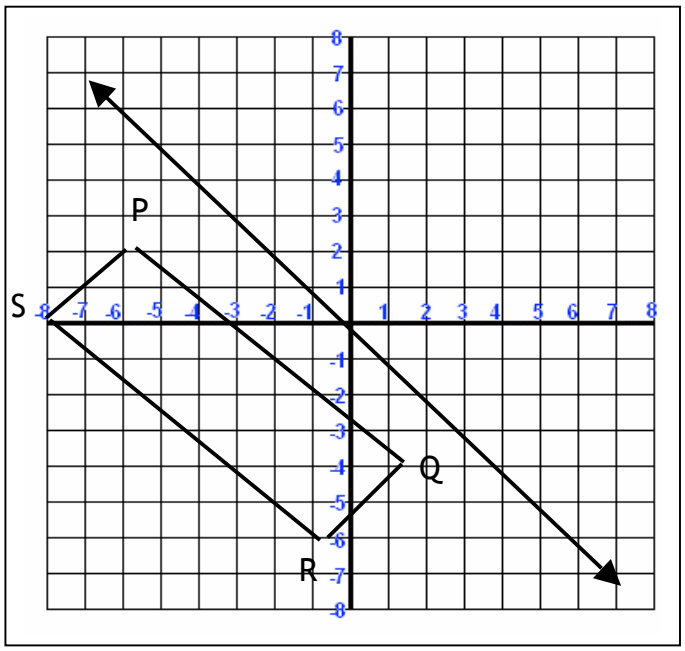
3) Reflect the point H(2, 4) over the line y=x.

The coordinate of the image is: H'(,)

Do the points you calculated match the image on the graph?

ANOTHER line that you should become familiar with is….

$y = -x$



The reflection of (x, y) across the line $y = -x$ is the point $(-y, -x)$.

EX:

(x, y) FLIP AND NEGATE! → $(-y, -x)$

$(1, 3)$ FLIP AND NEGATE! → $(-3, -1)$

You try:

1) Reflect the point P(-6 , 2) over the line y=-x.

The coordinate of the image is: P'(,)

2) Reflect the point S(-8 , 0) over the line y=-x.

The coordinate of the image is: S'(,)

3) Reflect the point R(-1, -6) over the line y=-x.

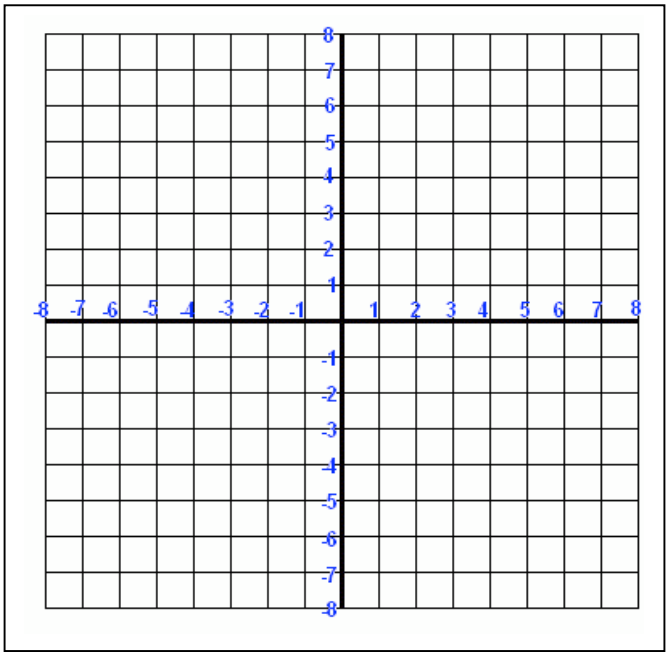
The coordinate of the image is: R'(,)

4) Reflect the point Q(1, -4) over the line y=-x.

The coordinate of the image is: Q'(,)

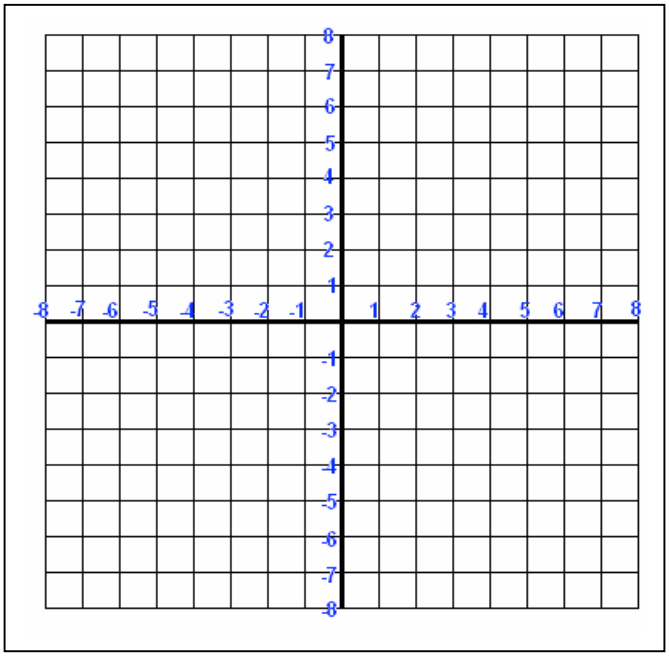
You Try: Draw rectangle GFHJ with vertices G(-6, 7) F(-3,7) H(-3,2) J(-6,2)

Reflect the rectangle over the line y=-x.



You Try: Draw triangle GFH with vertices G(-6, -7) F(-3,-7) H(-3,-2)

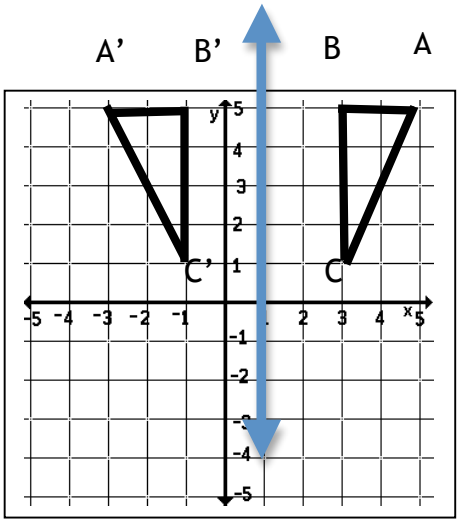
Reflect the triangle over the line y=x.



Identifying lines of reflections

To identify the line of reflection, find a line equal distance between the original and the image.

EX:



Step 1: Pick a point on the original and the corresponding coordinate of the image!

Ex. B(3 ,5) and B'(-1, 5)

Step 2: Count how many units are between the two coordinates

Ex. There are 4 units between B and B'

Step 3: The line of reflection is half that. So, split the units that was found in Step 2 in half

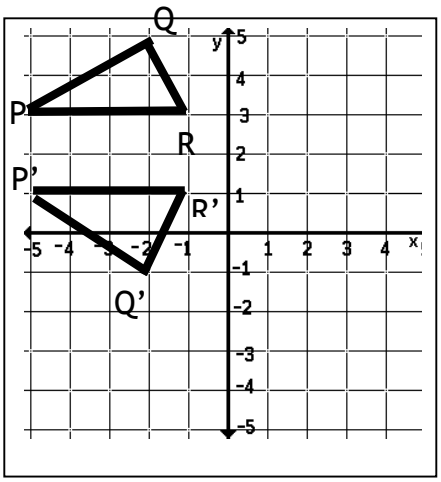
Ex. 4 divided by 2 = 2

Step 4: Find that point and plot it!

Step 5: Draw and label the line that goes through that point and is in between the two images.

Ex. x=1

EX: Identify the line of reflection



Step 1: Pick a point of the original shape and the

corresponding coordinate of the image!
Point _____ and Point _____

Step 2: Count how many units are between the two points

There are _____ units between ____ and ____.

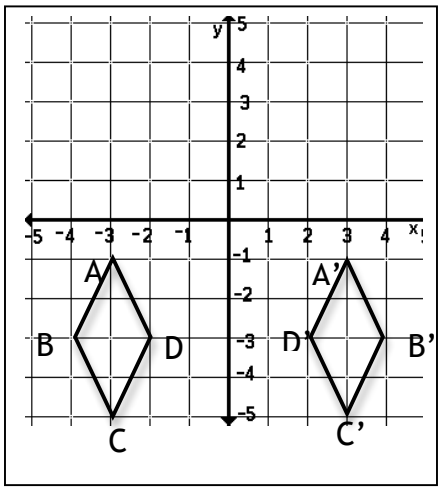
Step 3: Split the units that was found in Step 2 in half

_____ divided by 2 = _____

Step 4: Find that point and plot it!

Step 5: Draw and label the line that goes through that point and is in between the two images.

EX: Identify the line of reflection



Step 1: Pick a point of the original shape and the corresponding coordinate of the image!

Point _____ and Point _____

Step 2: Count how many units are between the two points

There are _____ units between ____ and ____.

Step 3: Split the units that was found in Step 2 in half

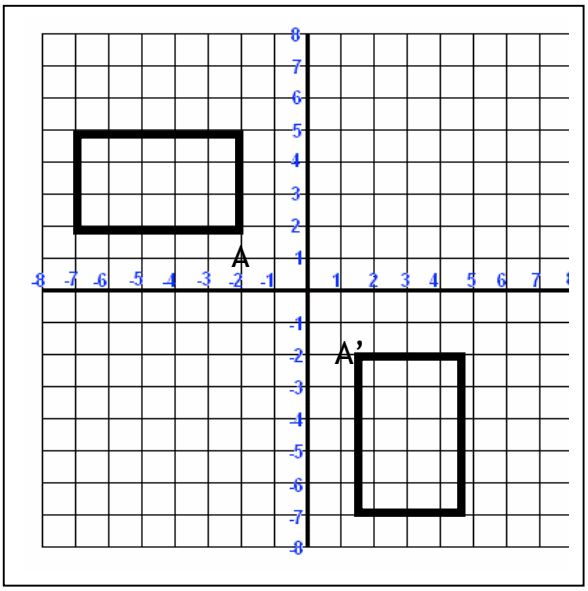
_____ divided by 2 = _____

Step 4: Find that point and plot it!

Step 5: Draw and label the line that goes through that point and is in between the two images.

TRY: Identify the line of reflection Your Work:

Hint: This is **not** a reflection over the x-axis or y-axis!



TRY: Identify the line of reflection Your Work:

Hint: This is **not** a reflection over the x-axis or y-axis!