Good ~~Morning~~ afternoon!

1. Make sure you are using First and Last name.

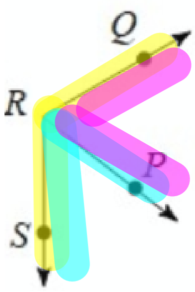
2. Type "here" for attendance.

3. Discuss practice quiz.

4. Take Quiz 1.

5. Transformations Notes

$m\angle QRS = 10x + 10$, $m\angle PRS = 4x + 8$, and $m\angle QRP = 68°$. Find x.



$10x + 10 = 4x + 8 + 68$

$10x + 10 = 4x + 76$

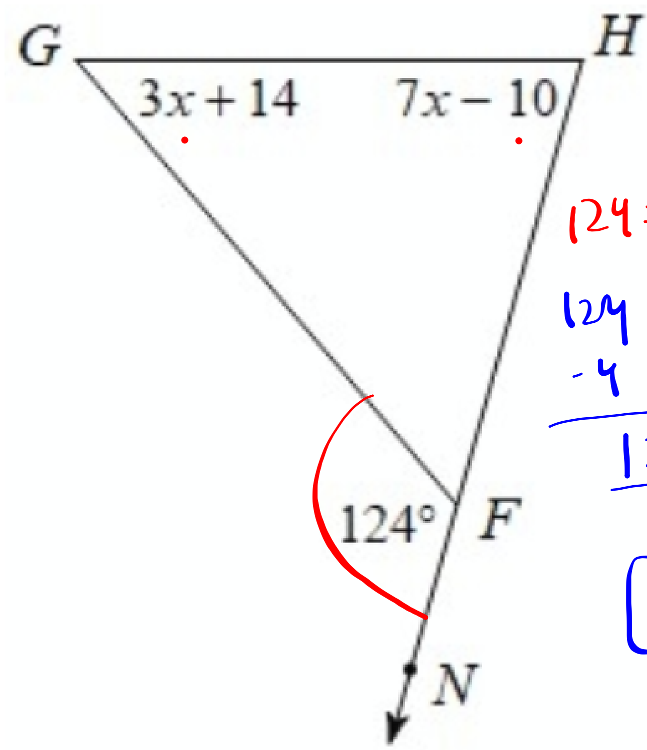
$-10 \qquad -10$

$10x = 4x + 66$

$-4x \qquad -4x$

$\frac{6x}{6} = \frac{66}{6}$

$x = 11$



Ext. Angle Thm.

$124 = (3x + 14) + (7x - 10)$

$124 = 10x + 4$

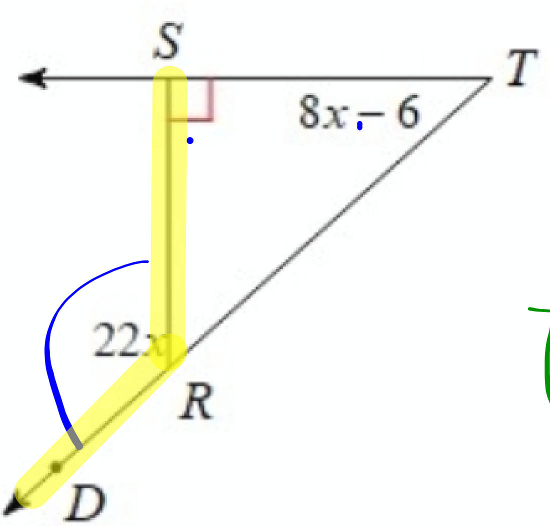
$-4 \quad -4$

$120 = 10x$

$\frac{120}{10} = \frac{10x}{10}$

$\boxed{12 = x}$

Find $m\angle DRS$.



$22x = 90 + 8x - 6$

$22x = 84 + 8x$

$-8x \quad -8x$

$14x = 84$

$\frac{14x}{14} = \frac{84}{14}$

$x = 6$

$22(6) = 132°$

When taking assessments,

1. Camera is ON.

2. No cheating.

Geometry F20 Quiz 1

3. As you guys finish, go ahead and get the notes ready for today!

Transformation Rules

Translation- moves every point of a figure by the same distance in a given direction. We can "slide" a point or a figure left, right, up or down.

- Right: (x,y)→ ____ This will shift the point "a" units **right**
- Left: (x,y)→ ____ This will shift a point "a" units **left**.
- Up: (x,y)→ ____ This will shift a point "b" units **up**
- Down: (x,y)→ ____ This will shift a point "b" units **down**.

Define

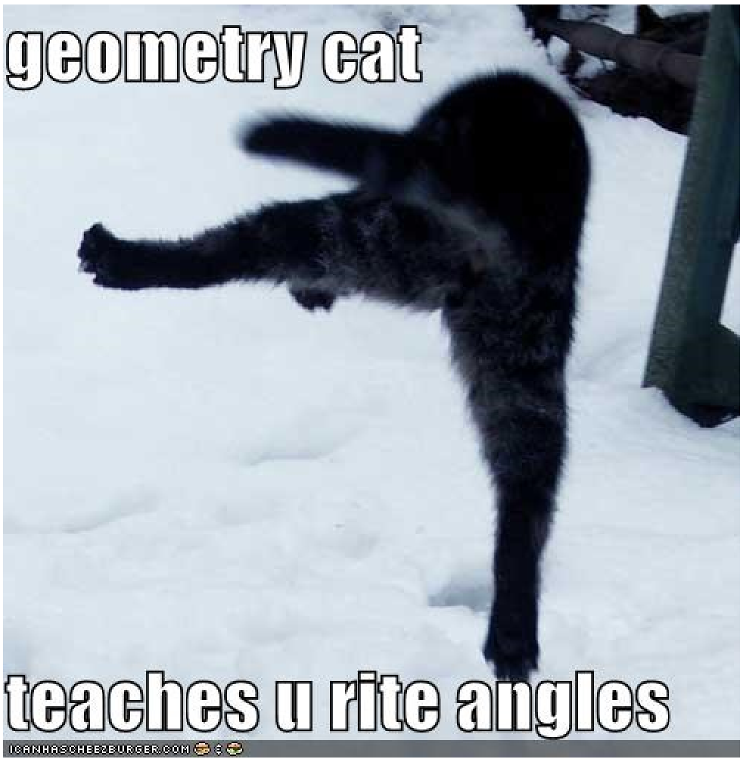
Pre Image: ____

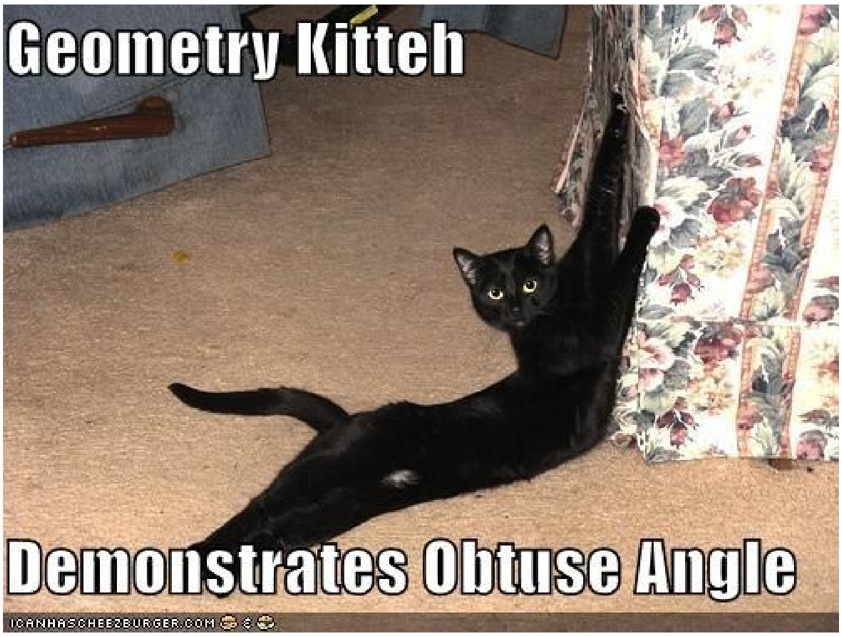
Image: ____

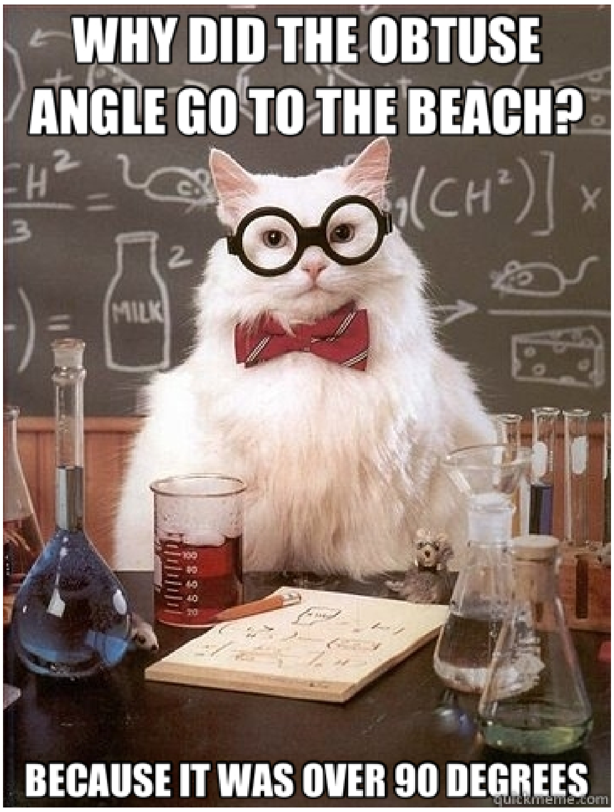
Examples:

Translate "A" Right 3 Units

Translate "A" Left 2 Units


geometry cat
teaches u rite angles
ICANHASCHEEZBURGER.COM


Geometry Kitteh
Demonstrates Obtuse Angle
ICANHASCHEEZBURGER.COM


WHY DID THE OBTUSE ANGLE GO TO THE BEACH?
BECAUSE IT WAS OVER 90 DEGREES
quickmeme.com

Transformation Rules

Translation- moves every point of a figure by the same distance in a given direction. We can "slide" a point or a figure left, right, up or down.

- Right: (x,y)→(x+a, y) This will shift the point "a" units **right**
- Left: (x,y)→(x-a, y) This will shift a point "a" units **left**.
- Up: (x,y)→(x, y+b) This will shift a point "b" units **up**
- Down: (x,y)→ (x, y-b) This will shift a point "b" units **down**.

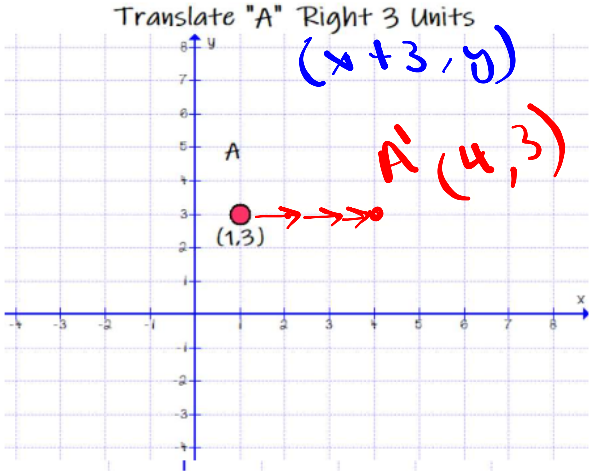
Define

Pre Image: The figure before any transformations have occurred

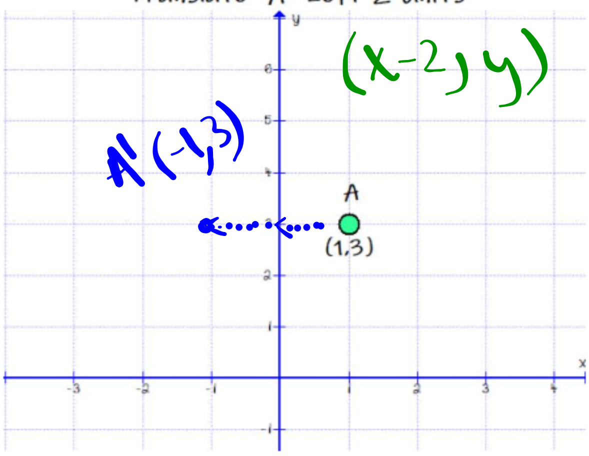
Image: The figure after transformations have occurred

Examples:

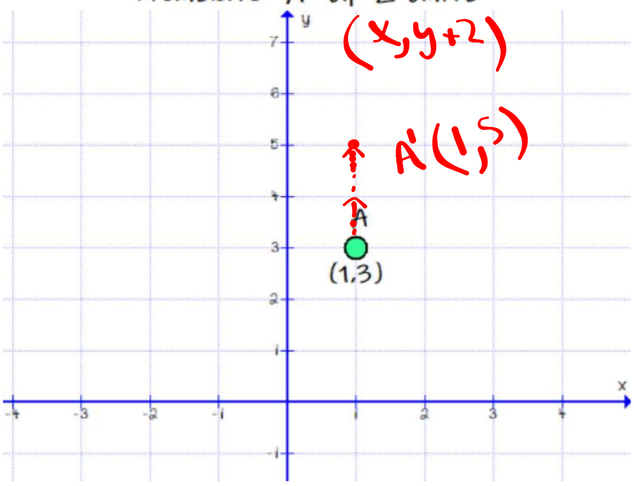
Translate "A" Right 3 Units



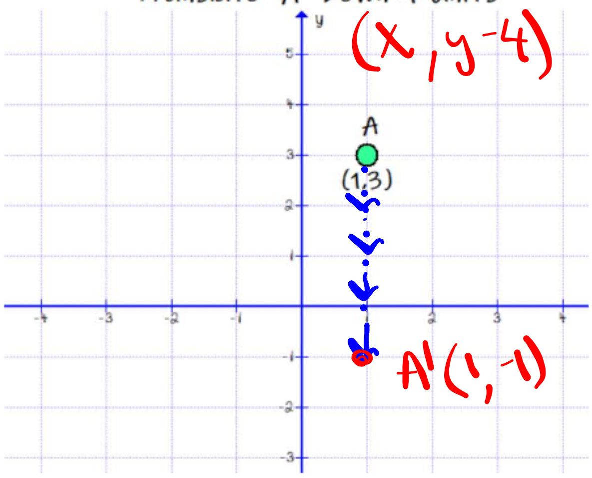
Translate "A" Left 2 Units



Translate "A" Up 2 Units

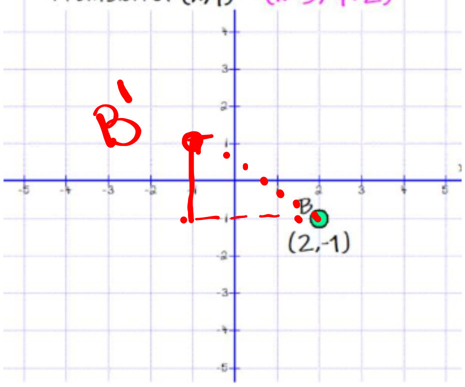


Translate "A" Down 4 Units

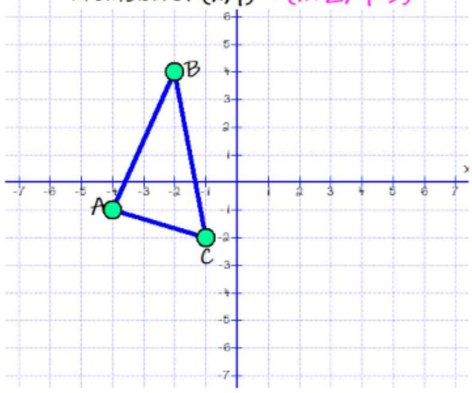


You Try!

1. Translate: (x,y)→(x-3, y+2)



2. Translate: (x,y)→(x+2, y-5)



3. **Working Backwards:** The coordinates shown were translated by the rule (x,y)→(x+5, y-2). What were the coordinates of the pre-image?

A (-3,7)→A'(2,5)

B (-1,9)→B' (4, 7)

C (0,1)→C' (5,-1)

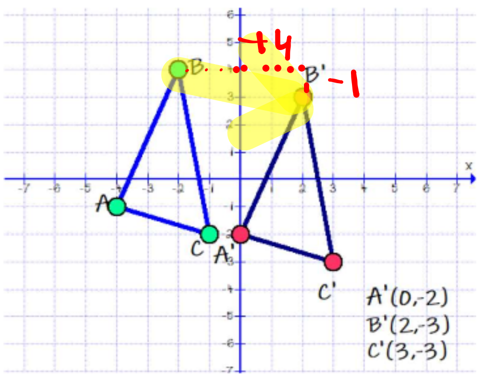
4. **Writing a rule**: Write a rule that would produce the translation shown below.

a. A (3,7) → A' (-5, 4) Rule: (x,y)→(x-8, y-3)

b. B (4, 5) → B' (9, -2) Rule: (x,y)→

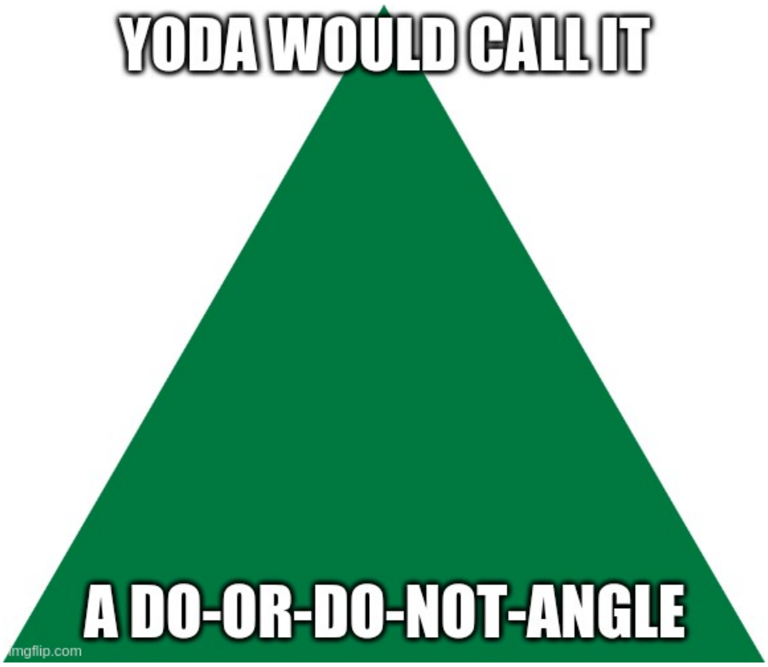
c. Using the figure, determine the rule for the translation that has occurred.

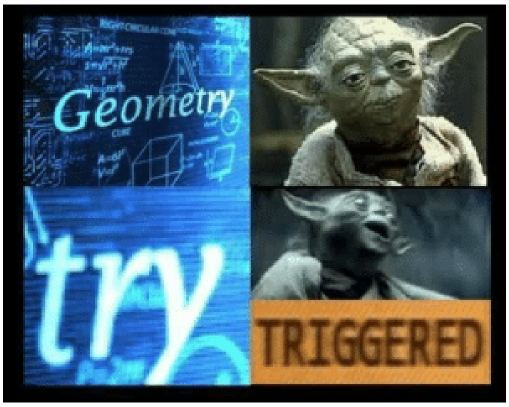
Rule: (x, y) → (x+4, y-1)



Good Morning!

1. Make sure you are using First and Last name.
2. Type "here" for attendance.
3. Finish up Transformation Notes.
4. Practice Rotations.
5. DeltaMath assignment will practice all three:)

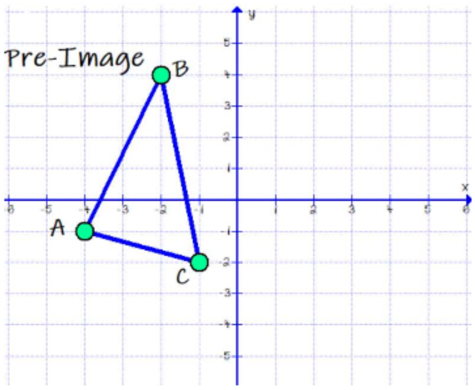

YODA WOULD CALL IT
A DO-OR-DO-NOT-ANGLE
imgflip.com

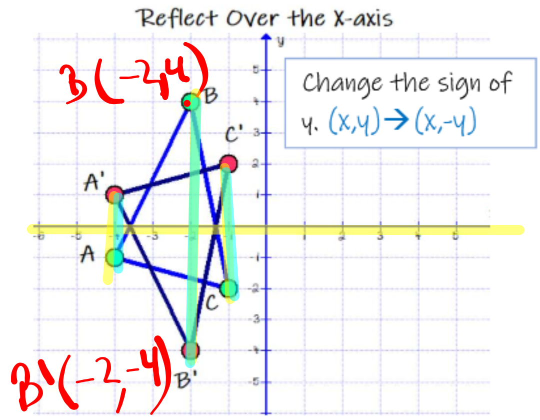

Geometry
try
TRIGGERED

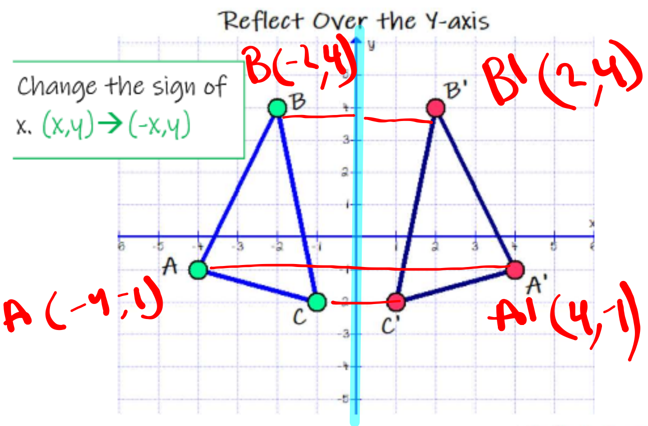
Reflections: A reflection "flips" a point or a figure over a given line. All the points of the image will be the same distance away from the line of reflection as the pre-image, just on the opposite side of the line.

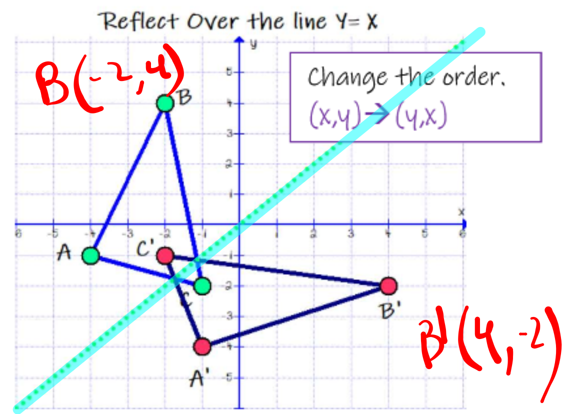
- Reflect over x-axis: Change the sign of y. (x,y)→(x,-y)
- Reflect over y-axis: Change the sign of x. (x,y)→(-x, y)
- Reflect over the line y = x: ~~Change~~ Switch the order. (x,y)→(y,x)
- Reflect over the line y = -x: ~~Change~~ Switch the order and change the signs. (x,y)→(-y,-x)

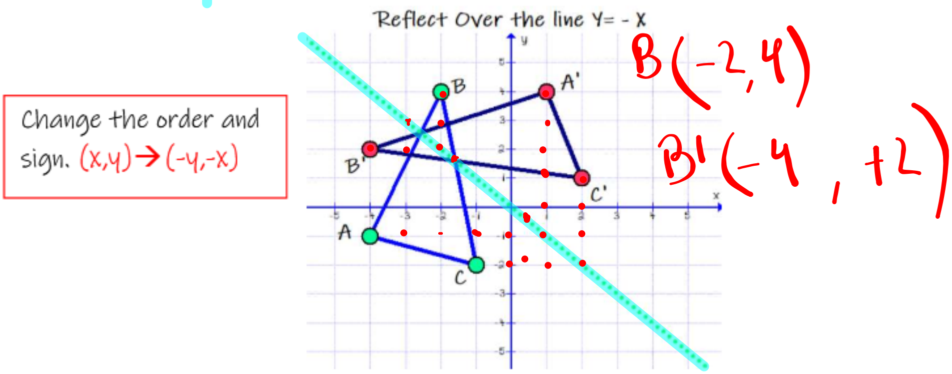
Examples:





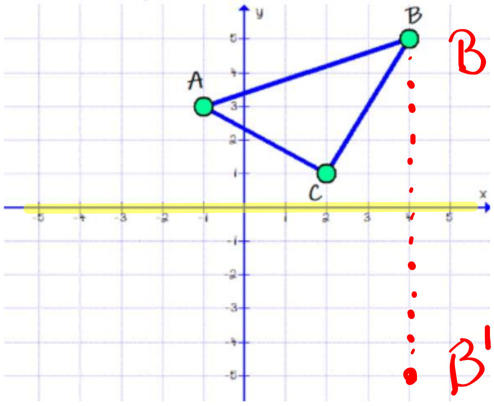




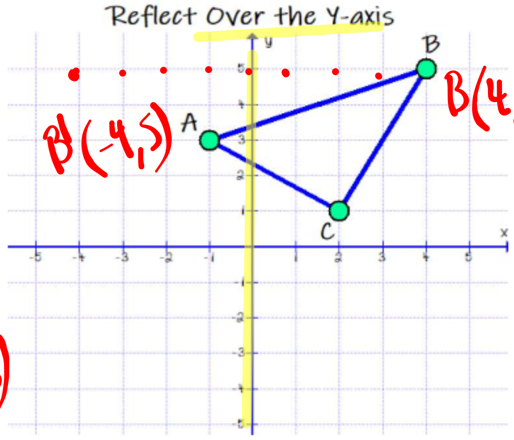


You Try!

1. Reflect Over the X-axis



2. Reflect Over the Y-axis



3. Apply the given reflection to the coordinates below.

a. Reflect over y = x (switch)
A(1,2) → A' (2,1)

b. Reflect over y = -x (switch & change)
B(3,-4) → B'(4,-3)

(+4 , -3)

c. Reflect over x-axis (change y)
C(-3,-2)→ C' (-3,2)

4. Determine the line of reflection:

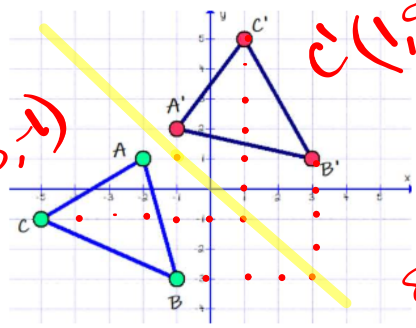
a. Given the coordinate:
A(1,2)→A'(-2,-1) (switch & change)
Reflect over y= - x

b. Given the coordinate:
B(3,-4)→B'(-3,-4) (change x)
Reflect over y-axis

c. Given the coordinate:
C(-3,-2)→ C'(-2,-3) (switch)
Reflect over y=x

5. Determine the line of reflection from the figures:

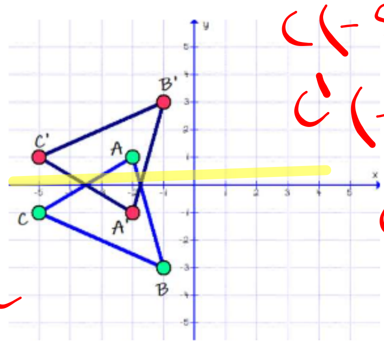
a.



switch & change

Reflect over y= - x

b.



change y

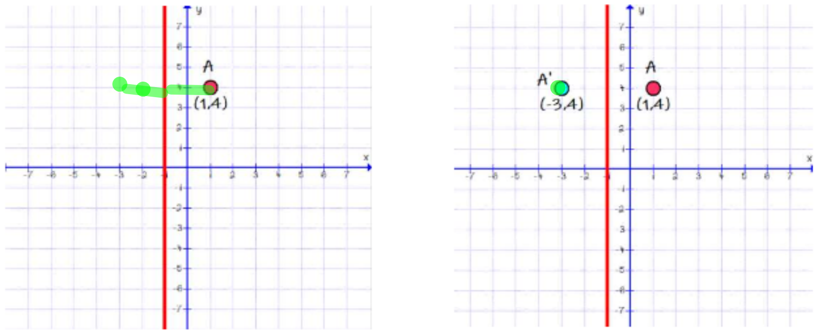
Reflect over x-axis

<u>Reflecting over a given line</u>: Mirror the points the same distance away on the other side

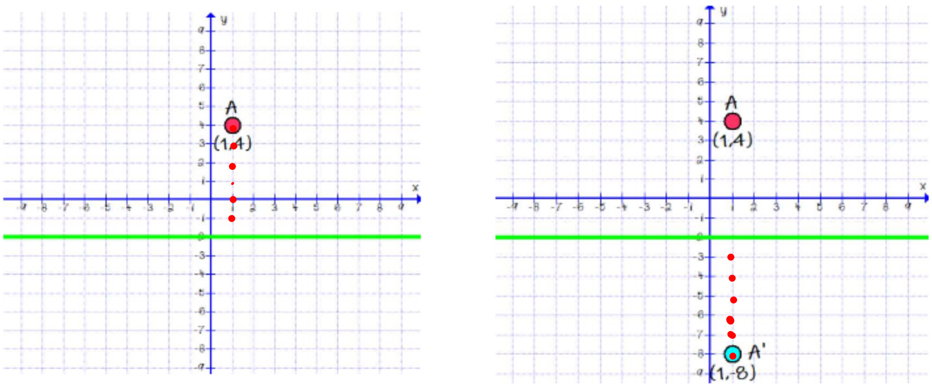
X = # is always a vertical line! Y = # is always a horizonal line!

Examples:

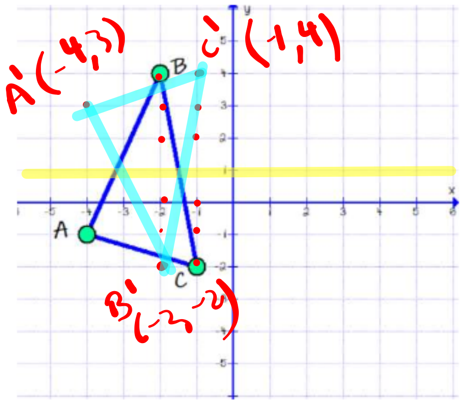
a. Reflect the point A over the line **x = -1**. "A" is two units away from the line **x = -1**, so we place A' two units away from **x = -1**, on the opposite side of the line.

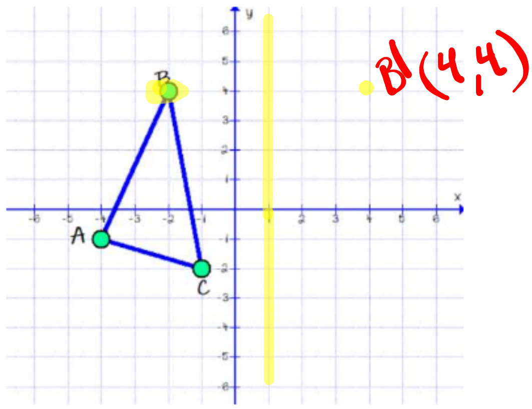


b. Reflect the point A over the line **y = -2**. The point A is six units from the line **y = -2**, so we place A' six units away from **y = -2** on the opposite side.



<u>You Try</u>! **A.** Reflect $\triangle ABC$ over the line y = 1. **B.** Reflect $\triangle ABC$ over the line x = 1.



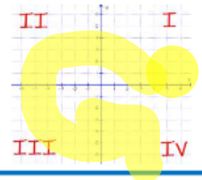


Rotations: When we rotate a point or figure, we are turning it about a fixed point called the **center of rotation.** We will assume that the center of rotation is the origin unless otherwise specified.

- When the center of rotation is the origin, we have a set of rules we can apply to our coordinate.
- The direction of rotation is understood to be **counter-clockwise** unless otherwise specified.

Why Counter Clockwise??

The quadrants of the coordinate plane are numbered in a <u>counter clockwise</u> direction.



90 Degrees CCW is the same as 270 CW

- Use the rule (x,y)→(-y,x)

switch and change 1st

270 Degrees CCW is the same as 90 CW

- Use the rule (x,y)→(y,-x)

switch and change last

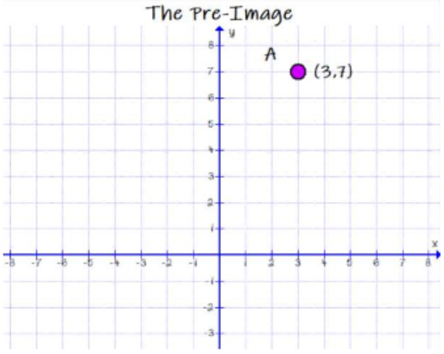
180 Degrees is the same in both directions

- Use the rule (x,y)→(-x,-y)

change both signs

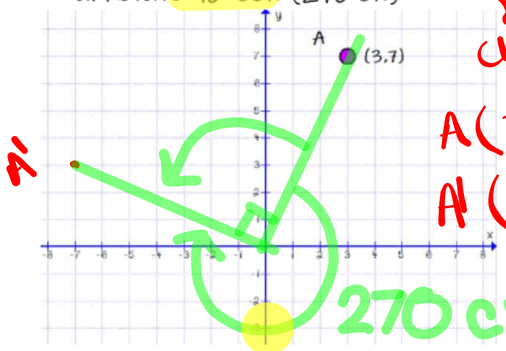
Examples with one point: A is the point (3,7). Let's look at what happens to it as we rotate.

The Pre-Image



a. Rotate 90° CCW (270 CW)

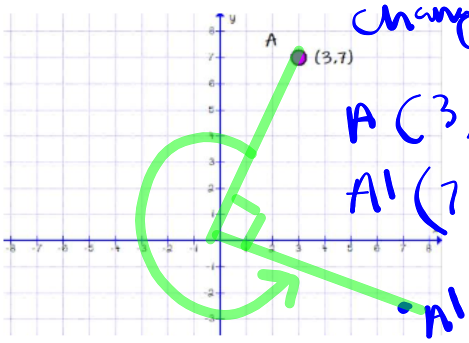
switch & change 1st



A(3,7)
A'(-7,3)

b. Rotate 270° CCW (90CW)

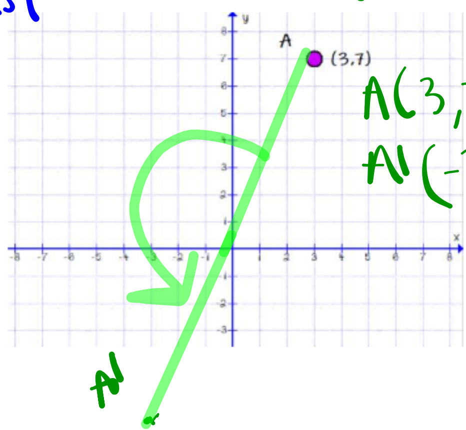
switch & change last



A(3,7)
A'(7,-3)

c. Rotate 180

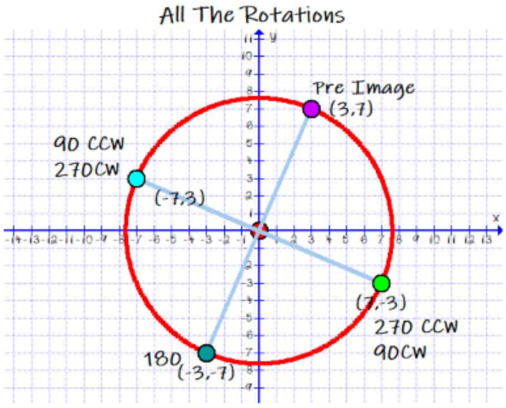
change both signs



A(3,7)
A'(-3,-7)

Look in Depth: What's really happening as we rotate?

- We are dragging our point along an imaginary circle! Each time we preform a rotation, the point will be the same distance away from the center of rotation, just a different spot!
- If we want to rotate about a point that is not the origin, the process is a little bit different....



When the center of rotation is NOT the origin, here's what we can do:

1. Subtract the center of rotation from your coordinate. This shifts the center of rotation back to the origin, allowing us to use our rules.
2. Apply the rule.
3. Add the center of rotation back to your coordinate. This shifts the center of rotation back to the right spot.

Take a Look: Rotate $\triangle ABC$ 180° about the point (-4,1)

1. Subtract the center of rotation from each coor

A (-3,-2) becomes (-3 – -4 , -2 – 1) = A*(1,-3)

B(-1,-4) becomes (-1 – -4 , -4 – 1) = B*(3,-5)

C (-3,-4) becomes (-3 – -4 , -4 – 1) = C*(1,-5)

2. Apply the Rule: 180 degrees (x,y)→(-x,-y)

A*(1,-3) becomes A**(-1,3)

B*(3,-5) becomes B** (-3,5)

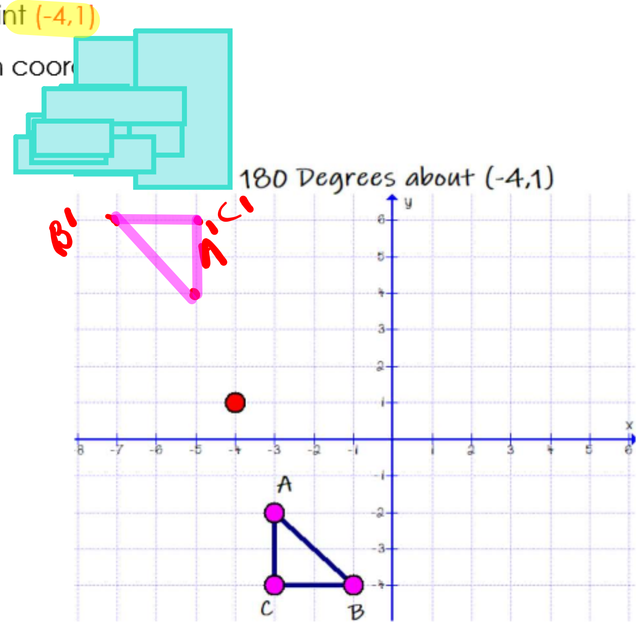
C*(1,-5) becomes C** (-1,5)

3. Add the Center of Rotation back in!

A**(-1,3) becomes (-1+ -4, 3 + 1)= A'(-5,4)

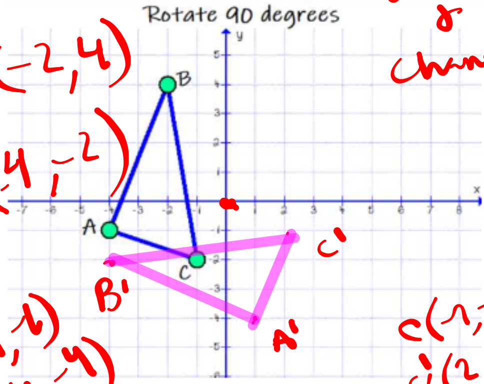
B**(-3,5) becomes (-3+ -4, 5+1)= B'(-7,6)

C** (-1,5) becomes (-1+ -4, 5+1) = C'(-5,6)

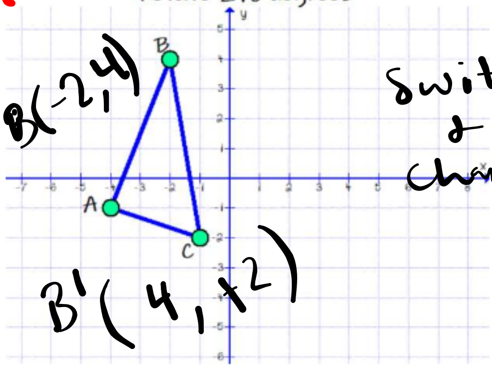


You Try!

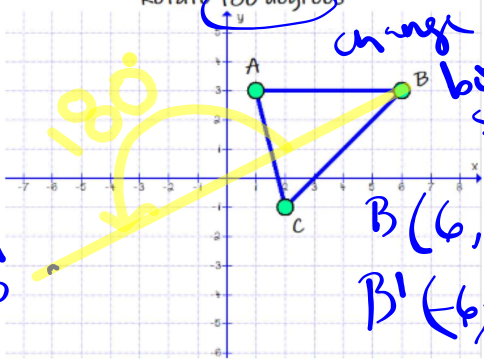
1. Rotate 90 degrees



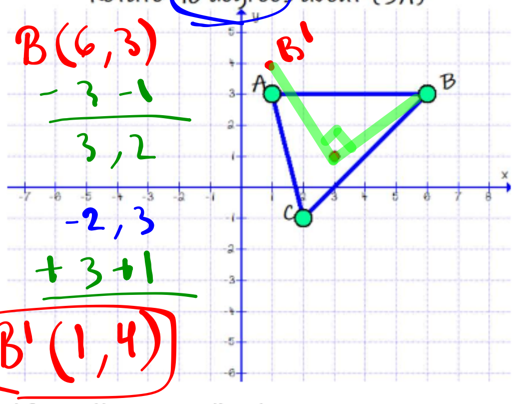
2. Rotate 270 degrees



3. Rotate 180 degrees



4. Rotate 90 degrees about (3,1)



5. Determine the transformation that has occurred from the coordinates:

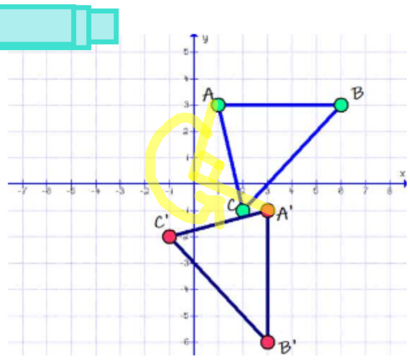
a. A(1,7) → A'(-7,1) — 90 degrees CCW

b. B(-2,5) → B'(5,2) — 270 degrees CCW

c. C(-2,-3) → C'(2,3) — 180 Degrees

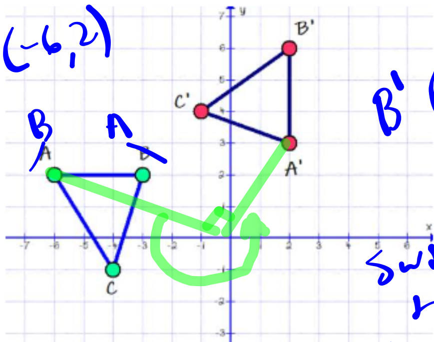
6. Determine the transformation that has occurred from the figures:

a.



270 degrees CCW

b.



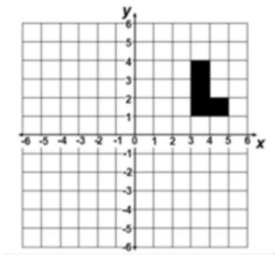
270 degrees CCW

Name: ______________________________ Date: ______________

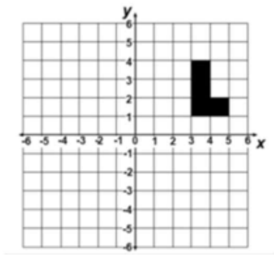
Rotations Practice

1. Where will the L-Shape be if it is…

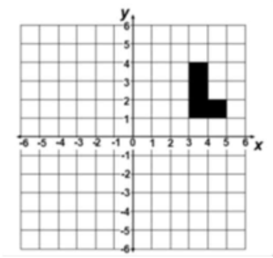
a. rotated 180° around the origin?



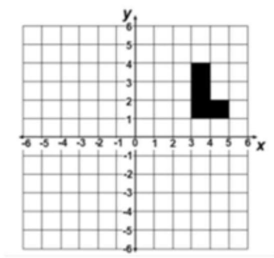
b. rotated 90° clockwise around the origin?



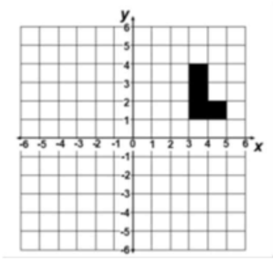
c. rotated 90° counterclockwise around the origin?



d. rotated 270° clockwise around the origin?

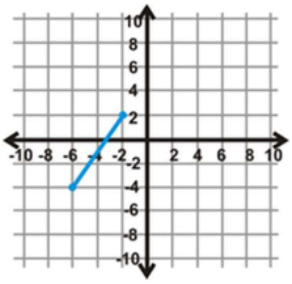


e. rotated 90° counterclockwise around the point (3, 0)?

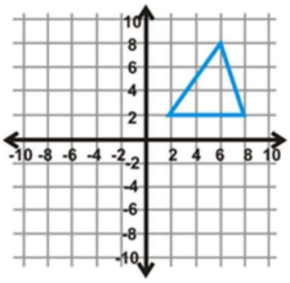


2. Rotate each figure about the origin using the given clockwise angle.

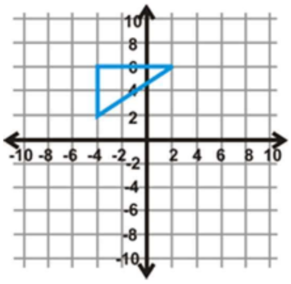
a. 180°



b. 270°

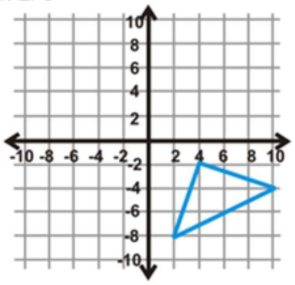


c. 90°

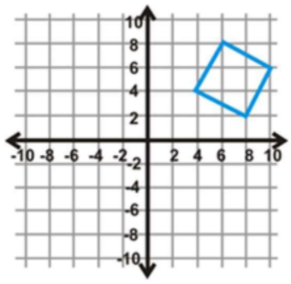


Adapted from: Mathematics Vision Project

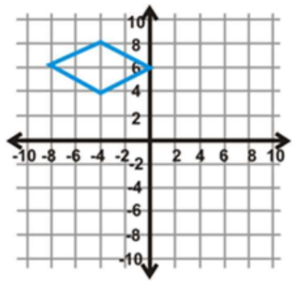
d. 270°



e. 180°

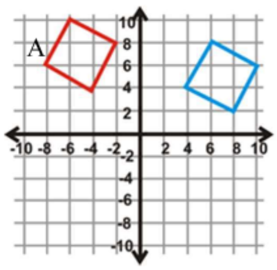


f. 90°

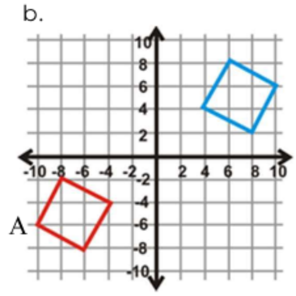


3. Find the angle of rotation for the graphs below. The center of rotation is the origin, and the Image labeled A is the preimage. Your answer will be 90°, 180°, or 270°.

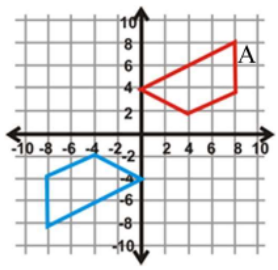
a.



b.



c.



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