Unit 6 Day 2

- Reflections across x-axis, y-axis, and y=x

Warm Up

Given ΔSTR write the new ordered pairs after $T'(5, -3)$.

S(-6, 8)

$S'(-1, 5)$

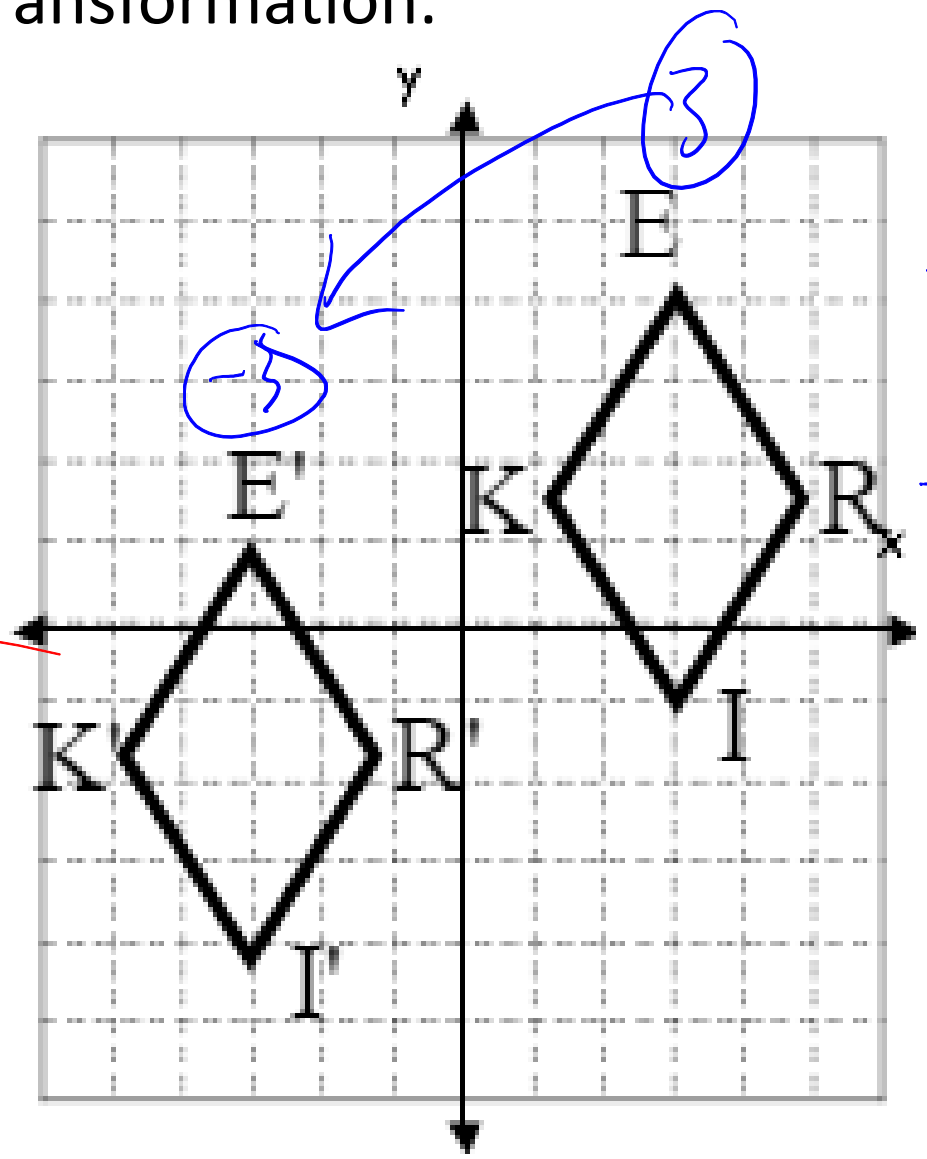
T(3, 5)

$T'(8, 2)$

R(2, -7)

$R'(7, -10)$

Write the rule for the following transformation.



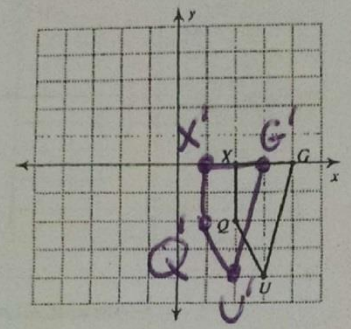
$T(x-6, y-3)$

or

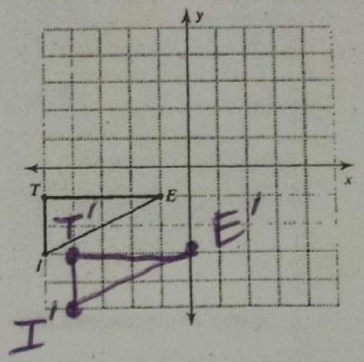
$T\begin{pmatrix} -6 \\ -3 \end{pmatrix}$

Graph the image of the figure using the translation given.

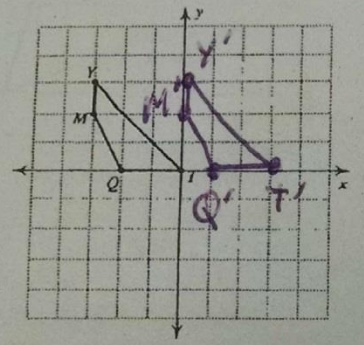
1) translation: 1 unit left



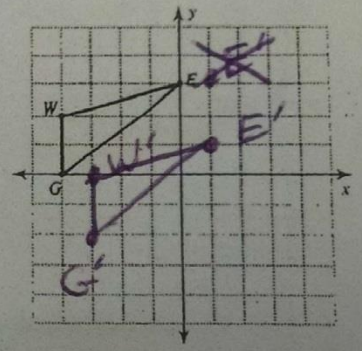
2) translation: 1 unit right and 2 units down



3) translation: 3 units right

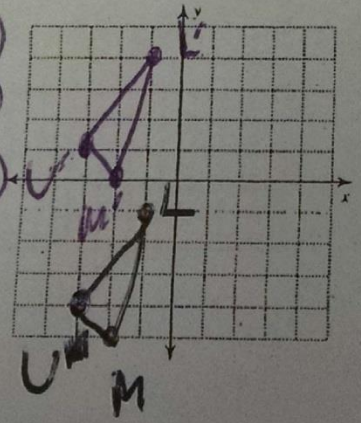


4) translation: 1 unit right and 2 units down

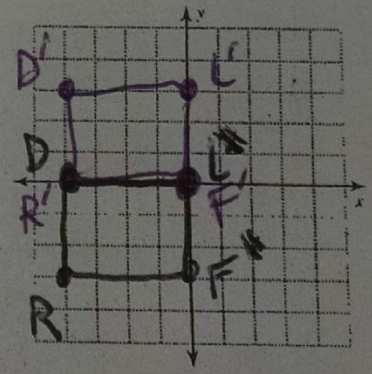


5) translation: 5 units up
$U(-3, -4)$, $M(-1, -1)$, $L(-2, -5)$

U'(2, -4)
M'(4, -1)
L'(3, -5)



6) translation: 3 units up
$R(-4, -3)$, $D(-4, 0)$, $L(0, 0)$, $F(0, -3)$



R'(-4, 0)
D'(-4, 3)
L'(0, 3)
F'(0, 0)

Find the coordinates of the vertices of each figure after the given transformation.

7) translation: 2 units left and 1 unit down
$Q(0, -1)$, $D(-2, 2)$, $V(2, 4)$, $J(3, 0)$

Q'(-2, -2) D'(-4, 1)
V'(0, 3) J'(1, -1)

8) translation: 2 units down
$D(-4, 1)$, $A(-2, 5)$, $S(-1, 4)$, $N(-1, 2)$

D'(-4, -1) A'(-2, 3)
S'(-1, 2) N'(-1, 0)

9) translation: 4 units left and 4 units up
$J(-1, -2)$, $A(-1, 0)$, $N(3, -3)$

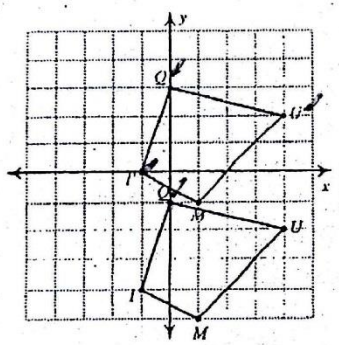
J'(-5, 2) A'(-5, 4)
N'(-1, 1)

10) translation: 3 units right and 4 units up
$Z(-4, -3)$, $I(-2, -2)$, $V(-2, -4)$

Z'(-1, 1) I'(1, 2)
V'(1, 0)

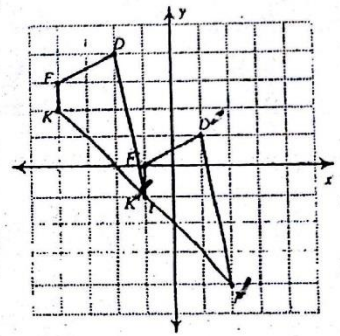
Write a rule to describe each transformation.

11)



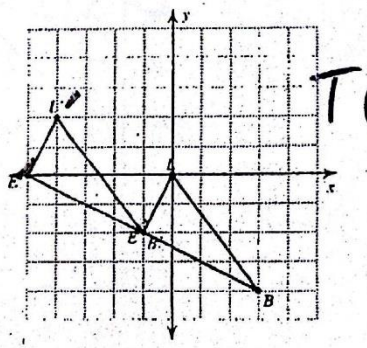
T(0, 4)

12)



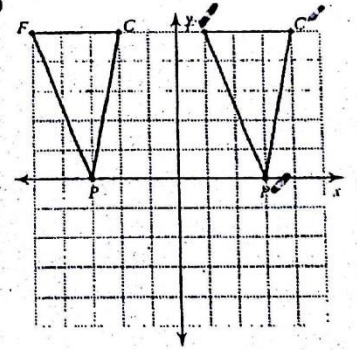
T(3, -3)

13)



T(-4, 2)

14)



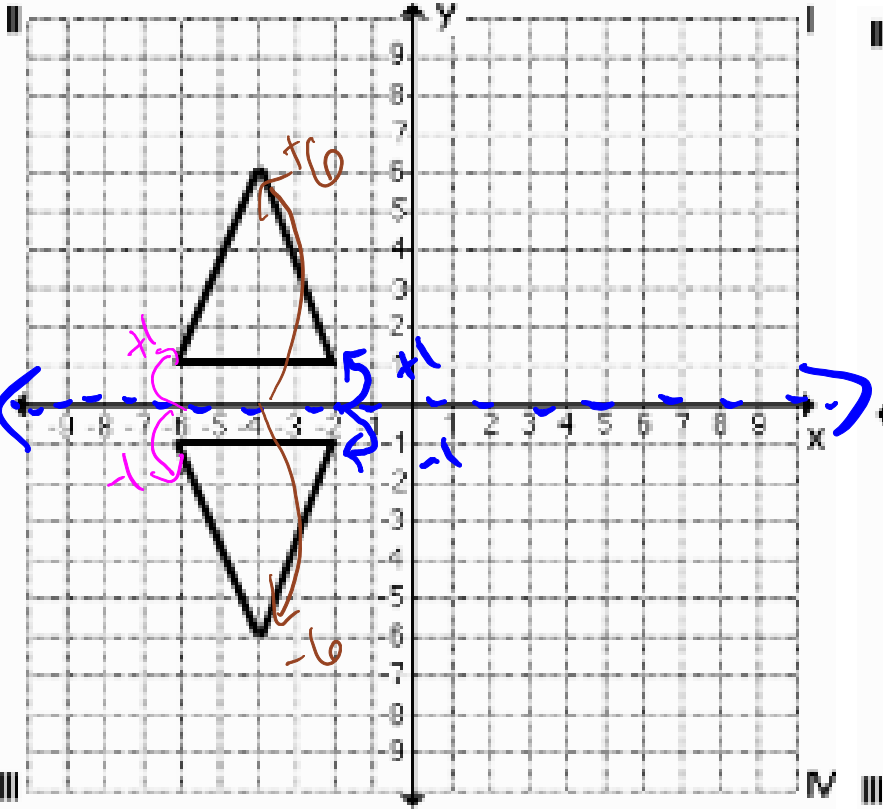
T(6, 0)

Notes – Day 2: Reflections

There are 3 basic types of reflections:

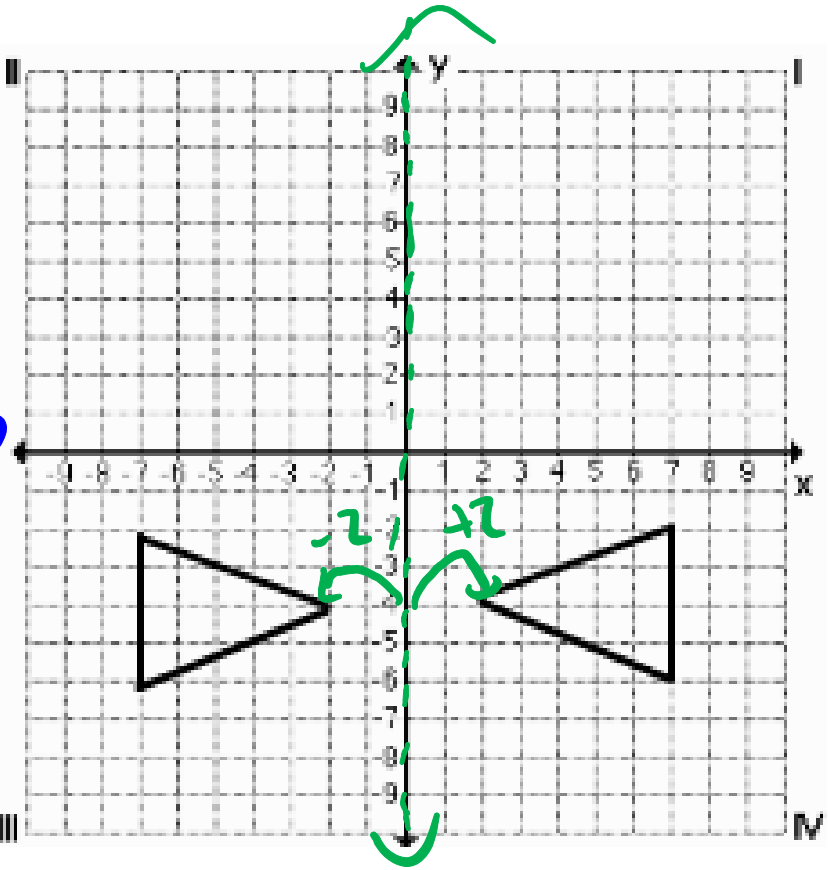
Across the x-axis.

(The line y=0.)



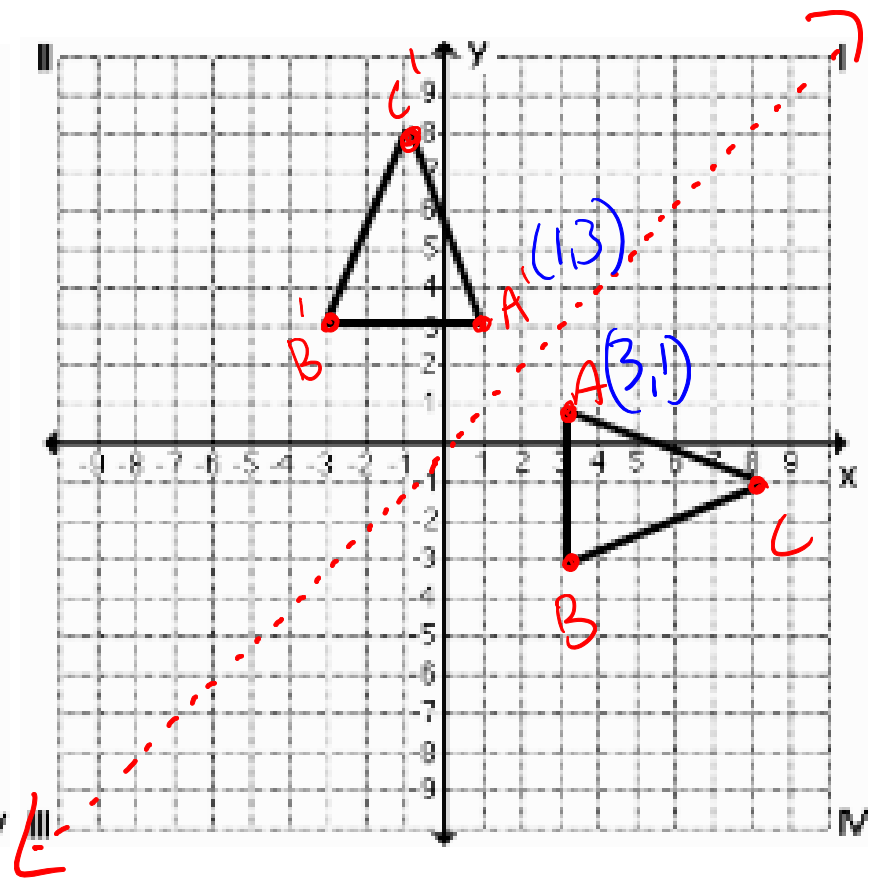
Across the y-axis.

(The line x=0.)



Across the line y=x.

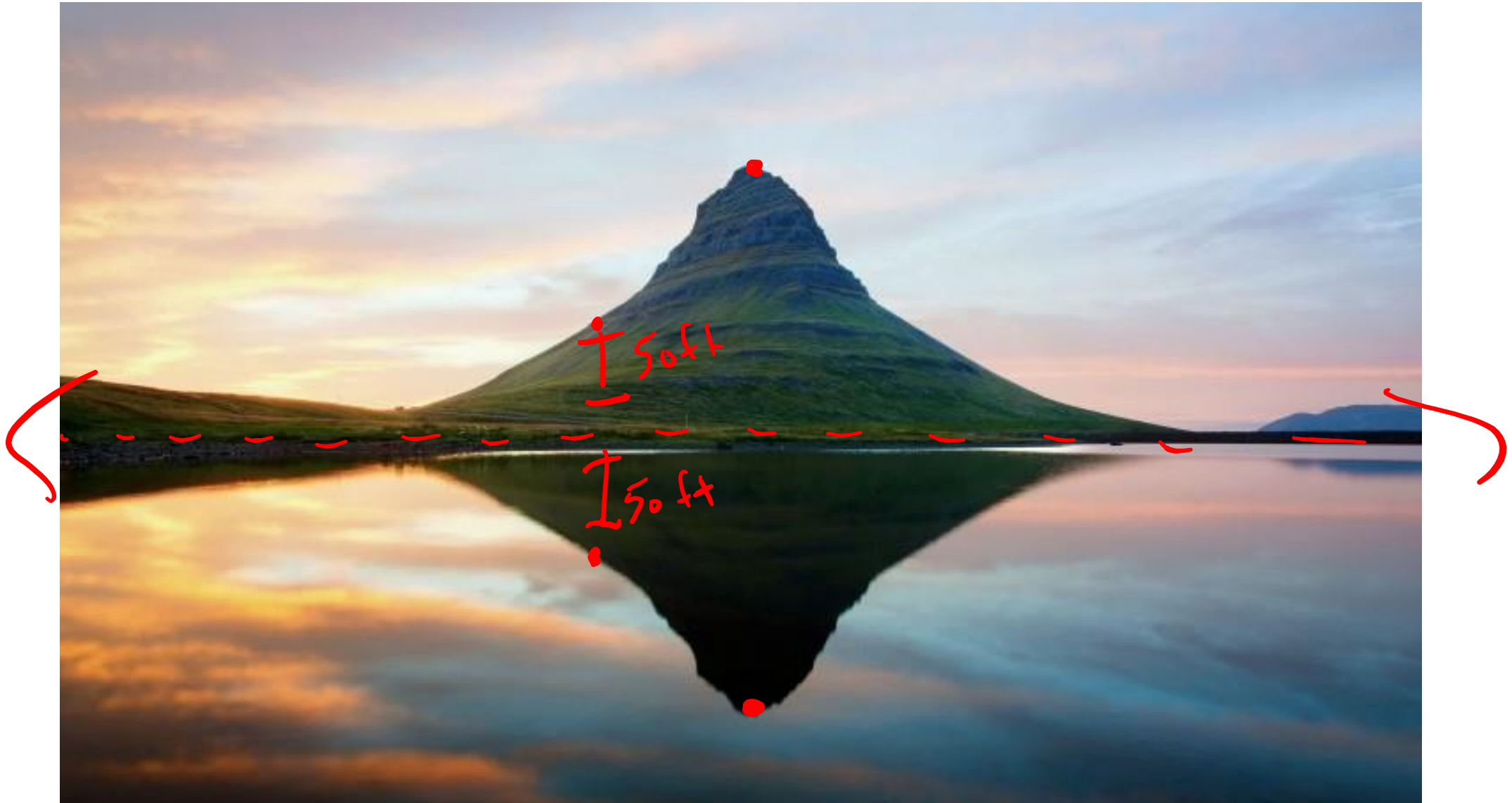
(3,2) → (2,3)



Notes: Rule for reflection across the x-axis.

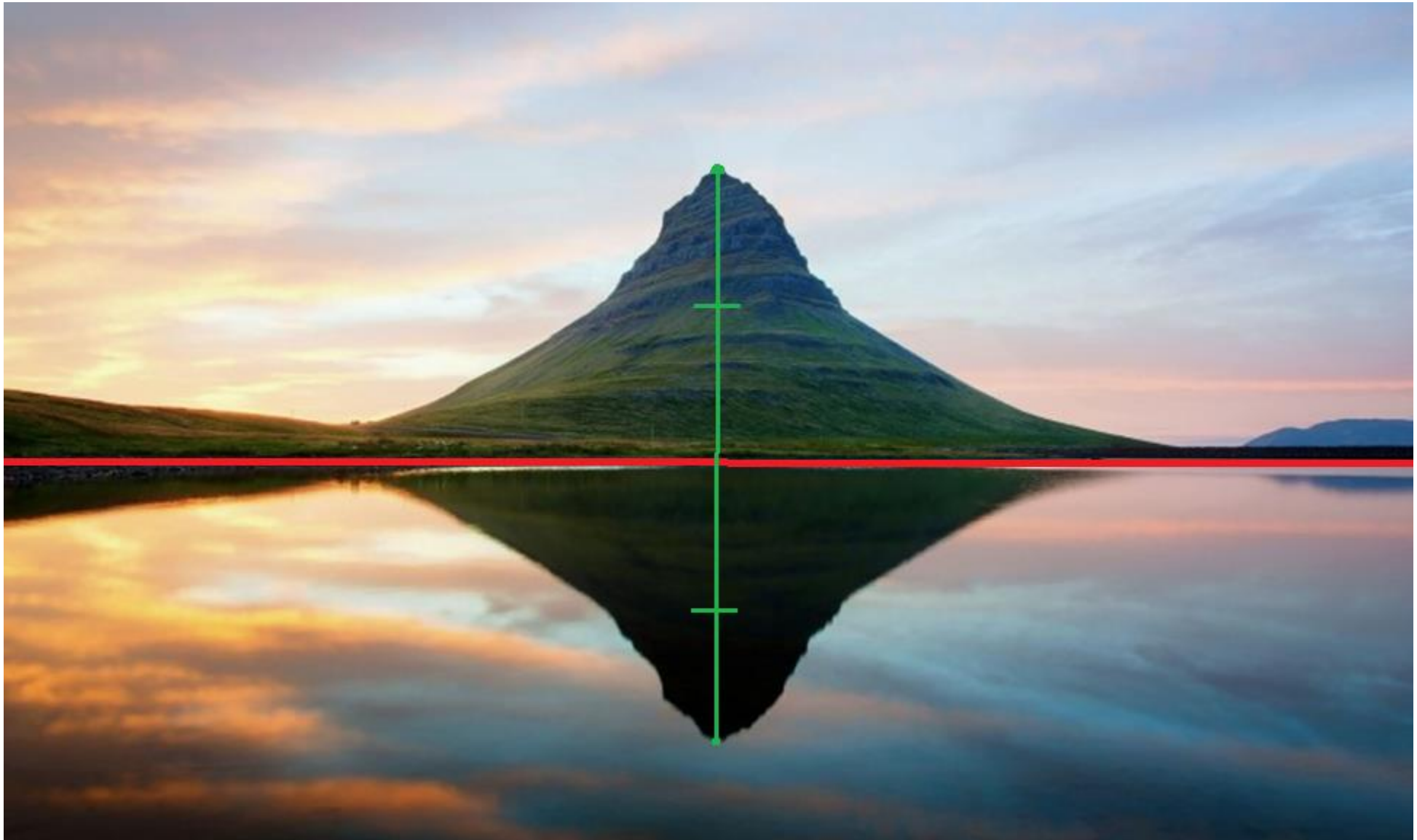
What do you notice about the mountain and its reflection?

What happened to the peak?



Notes: Rule for reflection across the x-axis.

Each point I select is an equal distance from the line of reflection.



Notes: Rule for reflection across the x-axis.

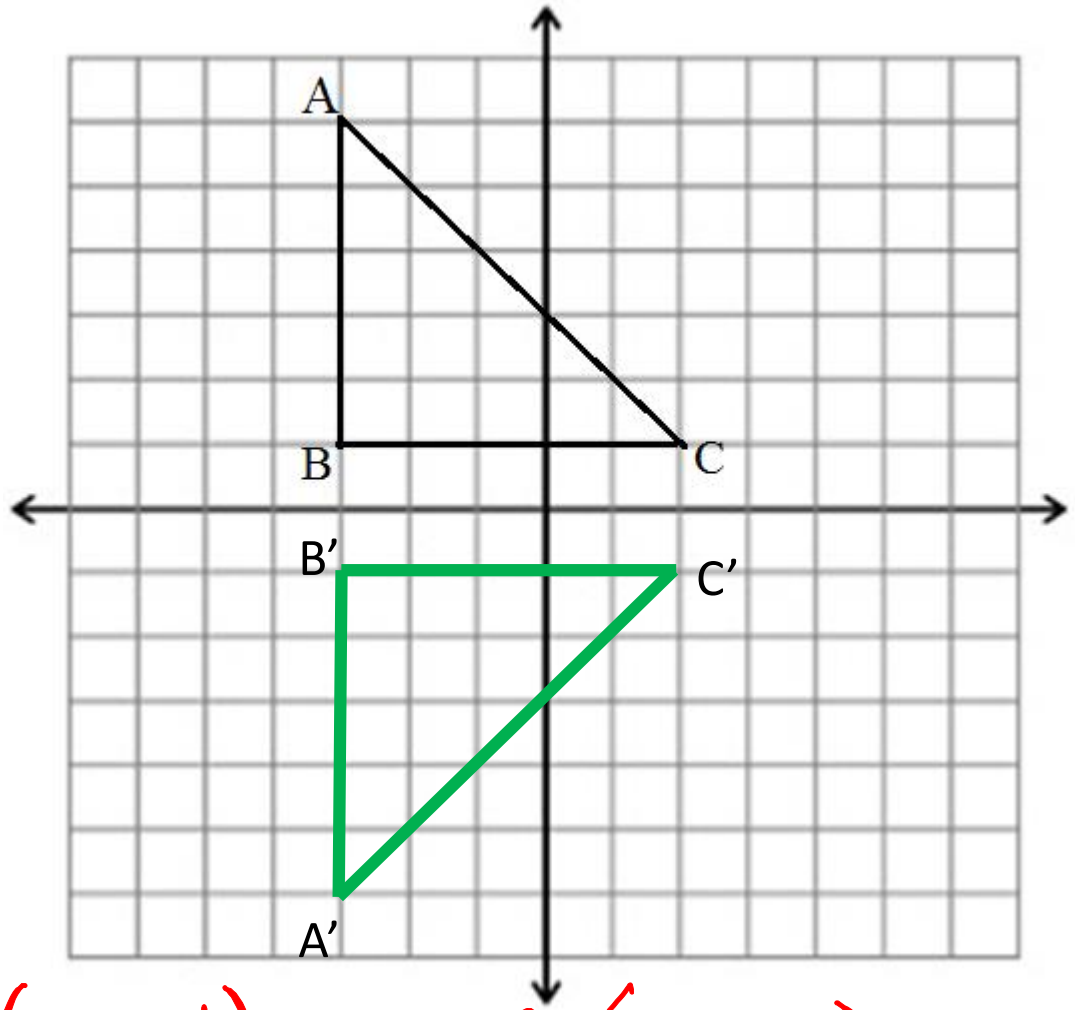
This is true for all reflections!

When reflecting across the x-axis, we are reflecting across the line y=0.

How far is vertex C from the line y=0?

Vertices A and B?

Notice none of the vertices moved left or right at all.



~~x-axis~~

Reflect $y=0$

B $(-3, 1)$ → -1 → B' $(-3, -1)$

C $(2, 1)$ → C': $(2, -1)$

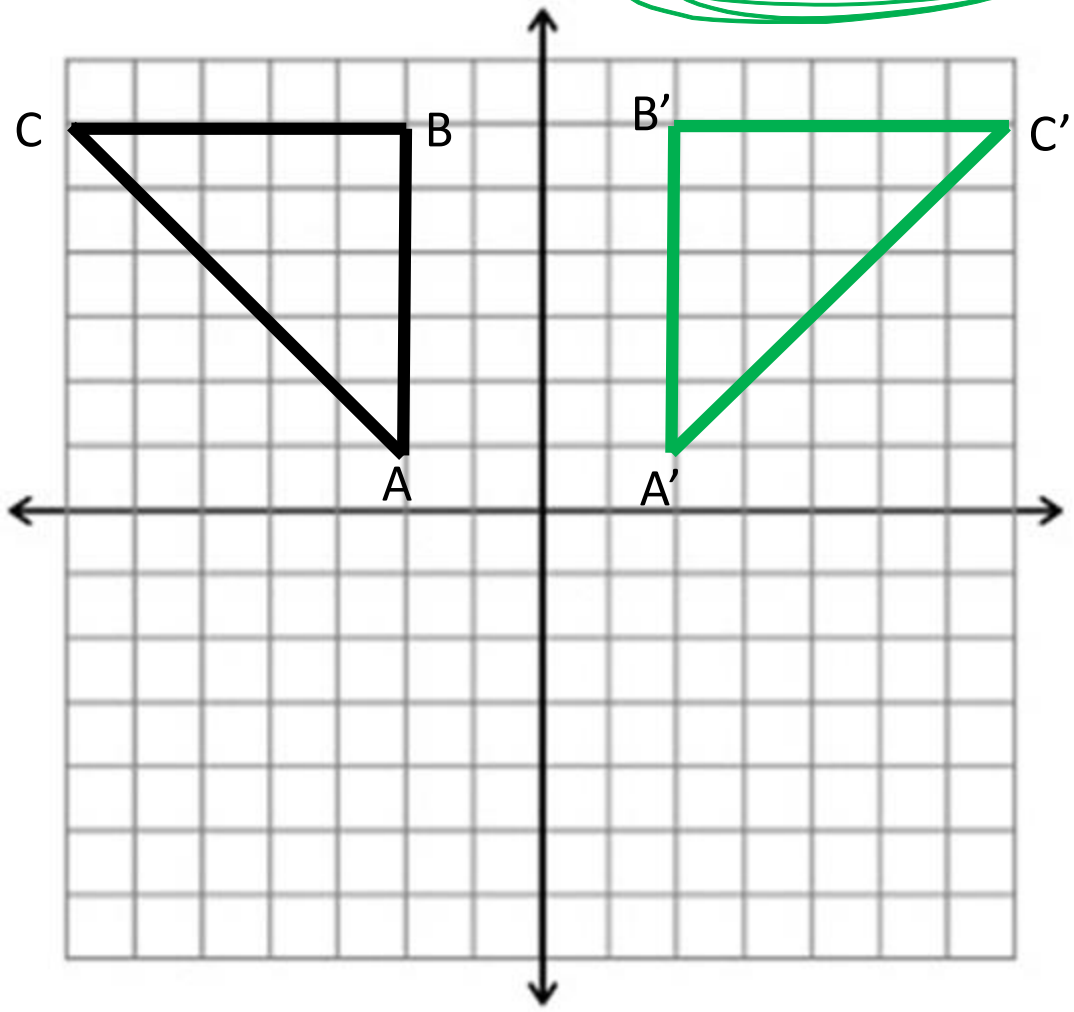
A $(-3, 6)$ → A' $(-3, -6)$

Notes: Rule for reflection across the x-axis.

The rule for a reflection across the x-axis is $(x, y) \rightarrow (x, -y)$.

Notes – Rule for reflection across the y-axis.

Based on the image below and our previous discussion, can you figure out the rule for a reflection across the y-axis (the line x=0)?



Notes

Graph the figure.

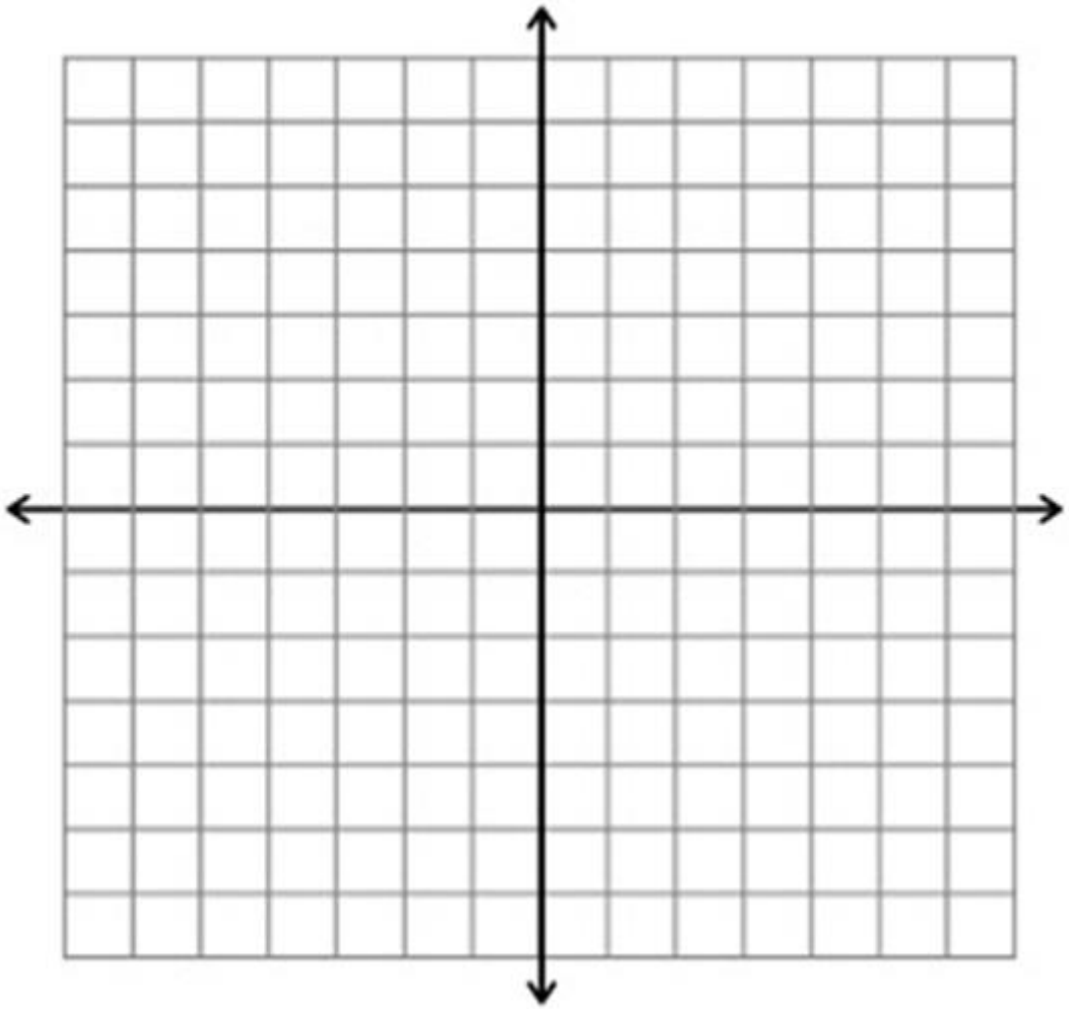
Reflect each of the following and state the new coordinates.

1a) J(-2, 4) U(3, 0) A(-5, -4) N(2, -5)

J'(2, 4) U'(-3, 0) A'(5, -4) N'(-2, -5)

a) Reflect across the ~~x~~-axis.

$x = 0$



Notes

Graph the figure.

Reflect each of the following and state the new coordinates.

1b) J(-2, 4) U(3, 0) A(-5, -4) N(2, -5)

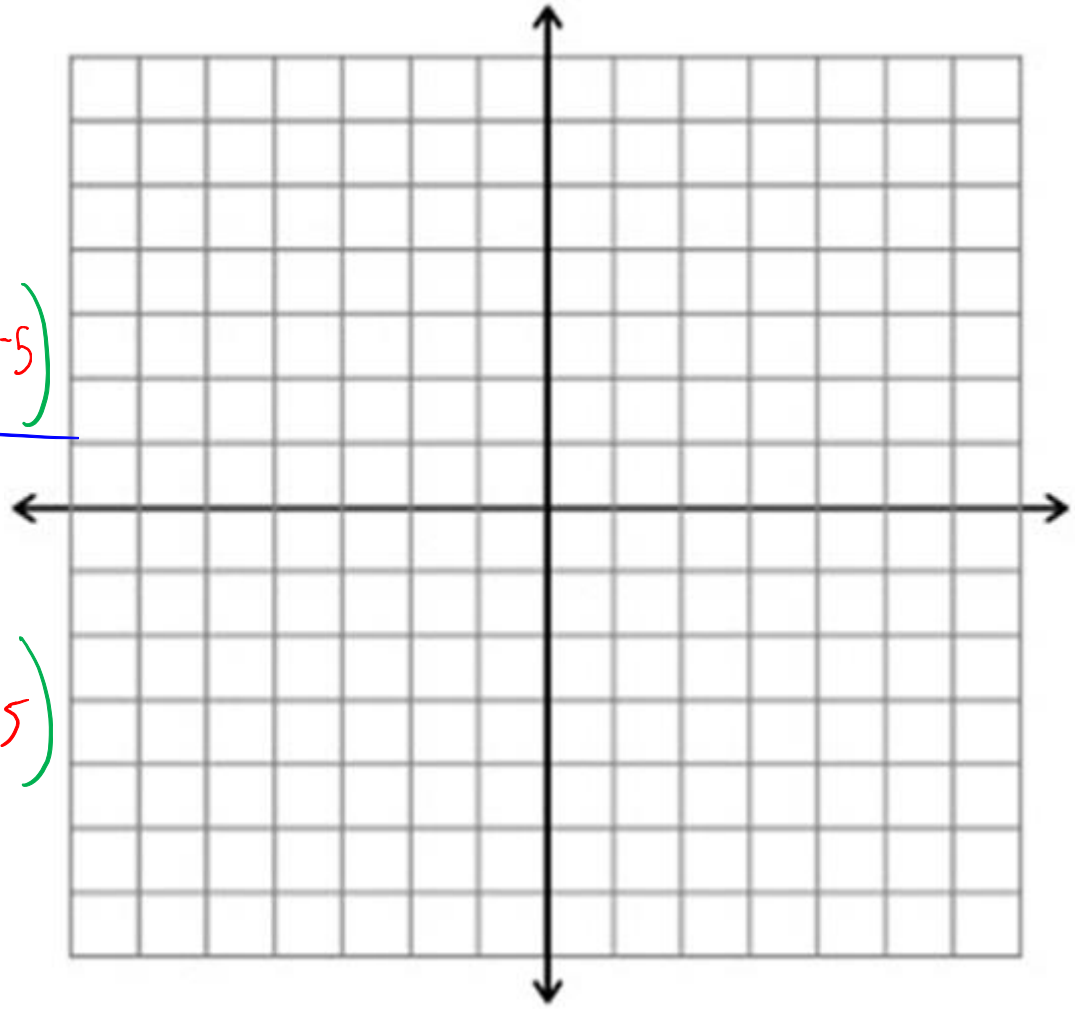
0 0 0 0

b) Reflect across the y-axis. x=0

J'(2, 4) U'(-3, 0) A'(5, -4) N'(-2, -5)

X- axis

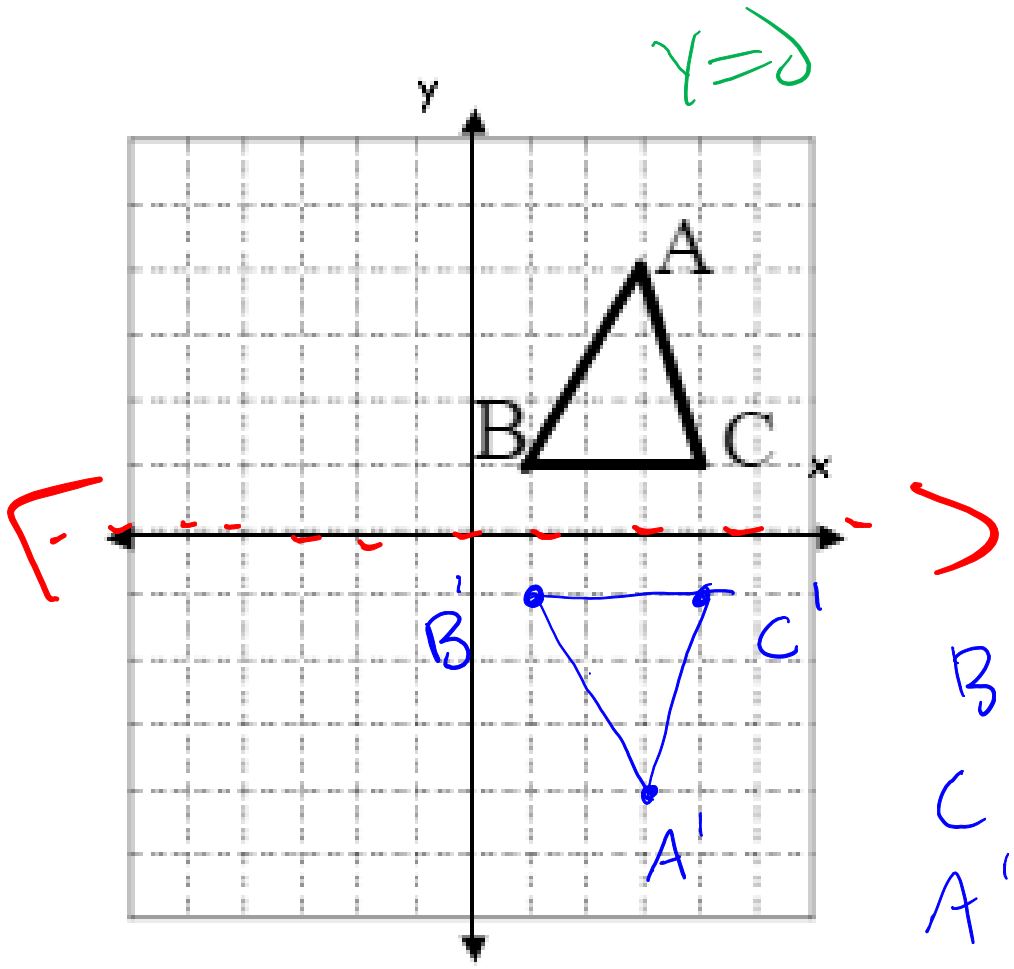
J'(-2, -4) U'(3, 0) A'(-5, 4) N'(2, 5)



Notes

Reflect each of the following and state the new coordinates.

2) across the ~~x~~-axis

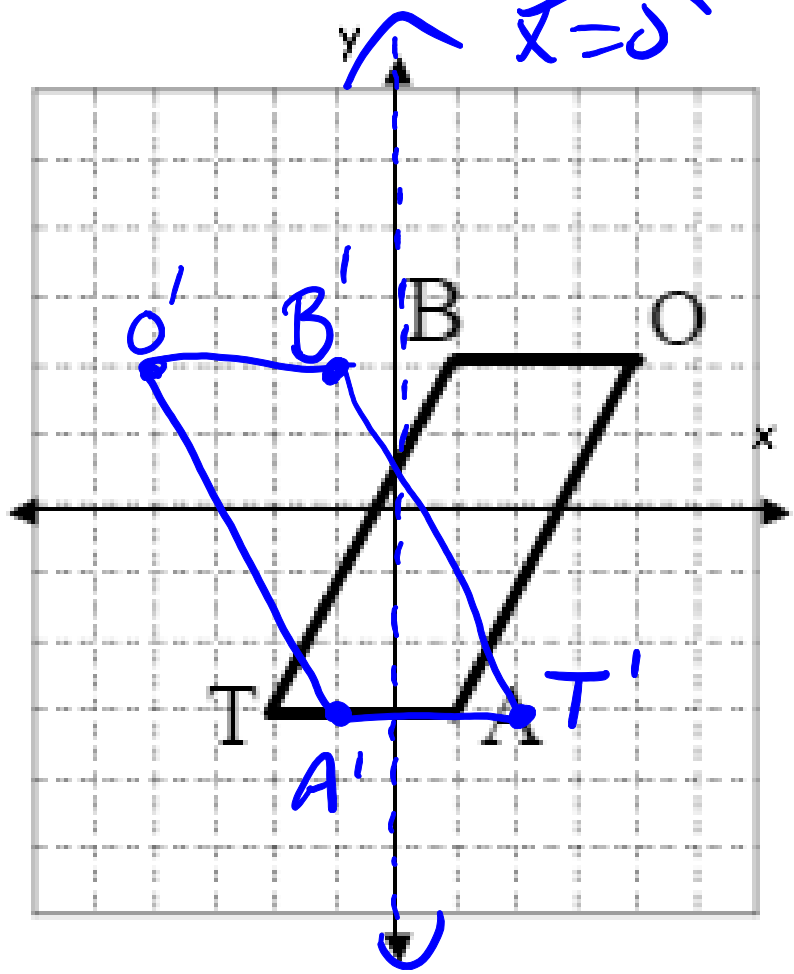


B'(1,-1)

C'(4,-1)

A'(3,-1)

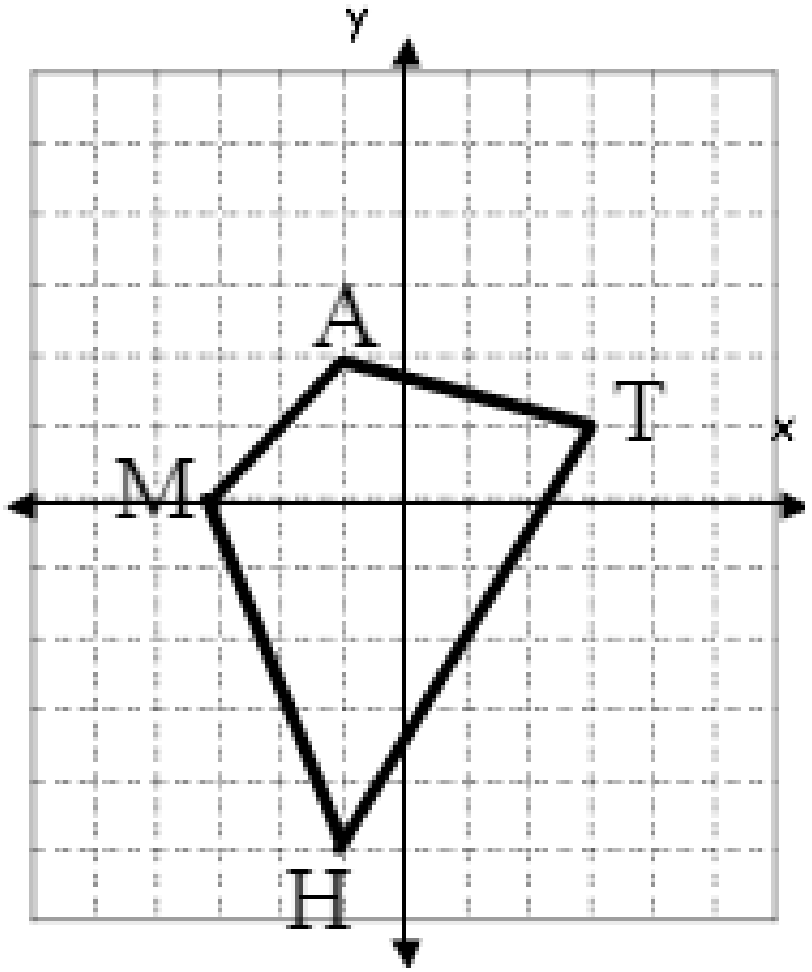
3) across the y-axis



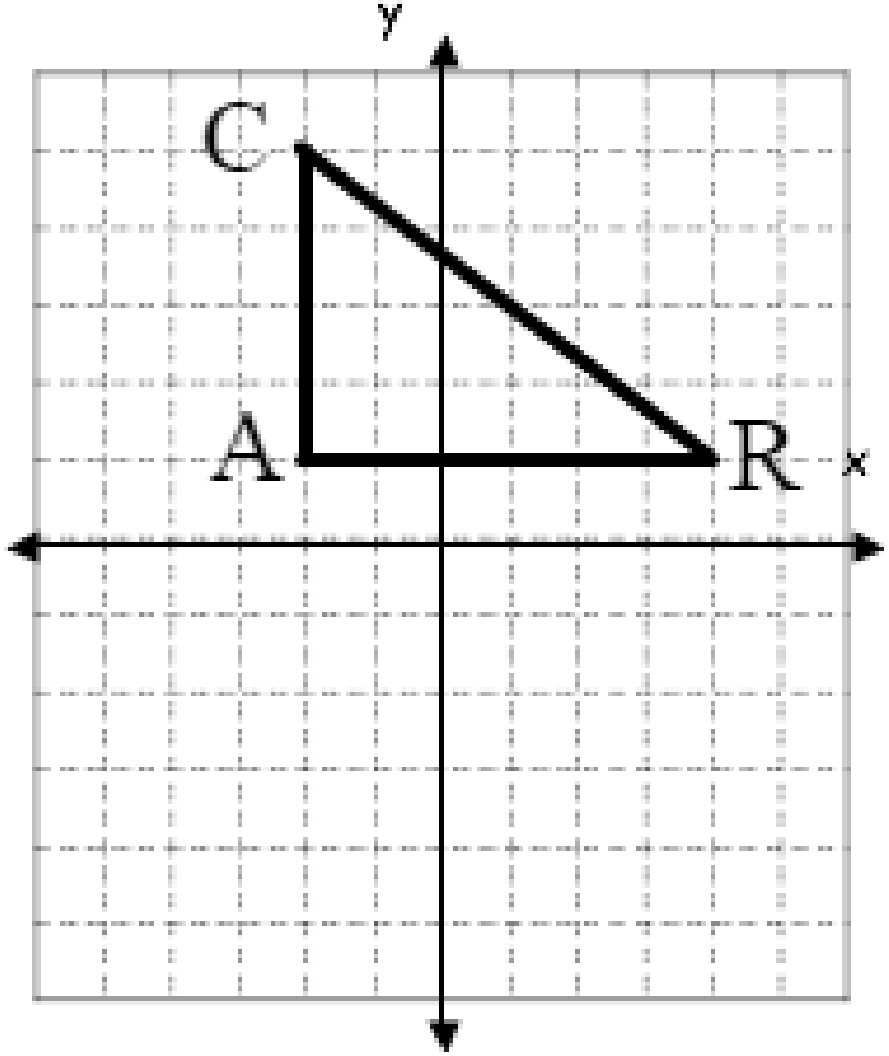
Notes – You Try!

Reflect each of the following and state the new coordinates.

4) Across the y-axis.



5) Across the x-axis.



Notes

Reflect each of the following and state the new coordinates.

6) D(2, -3) E(1, 4) N(5, 6) over the [illegible].

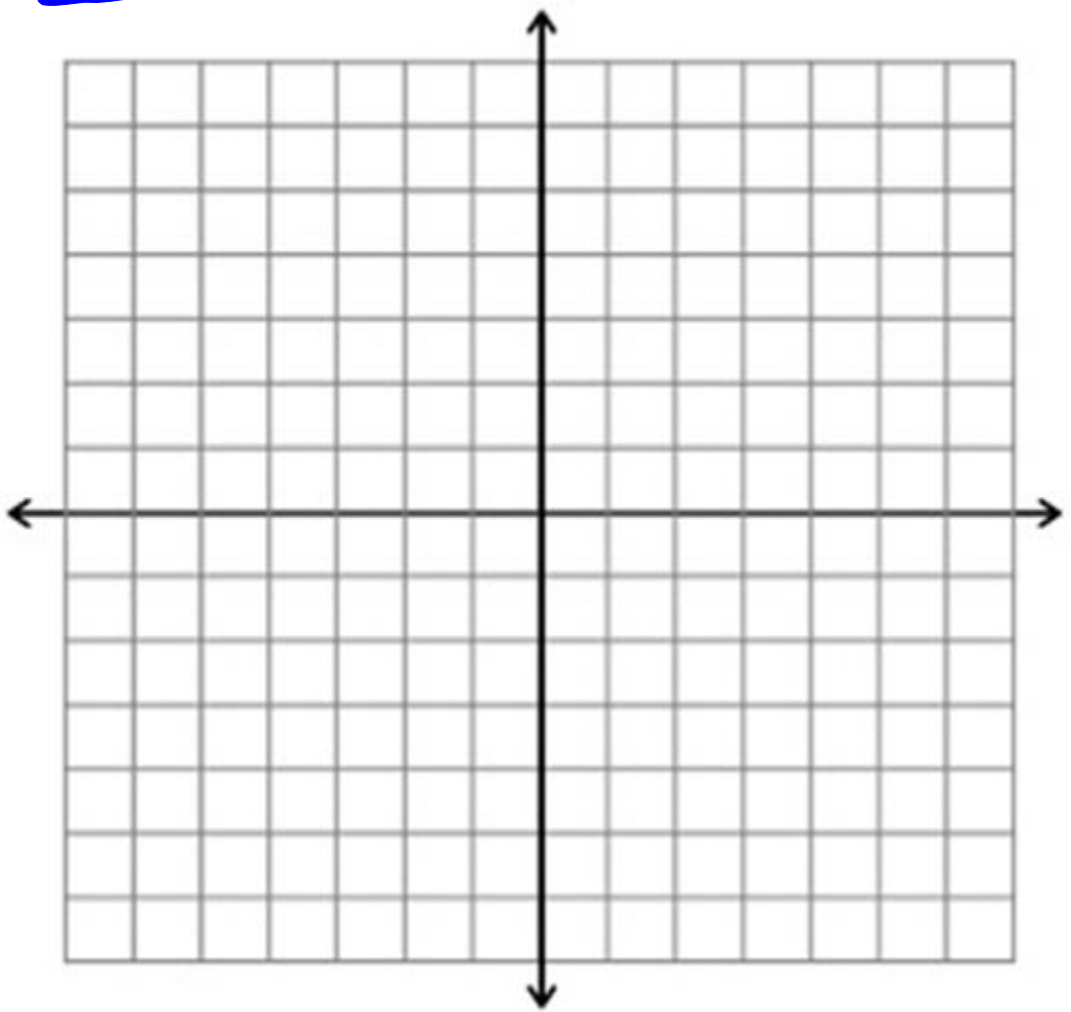
+0 2 -0

-1 2 +1

+3 2 -3

D'(2, -3) E'(3, 4) N'(-1, 6)

X = 2



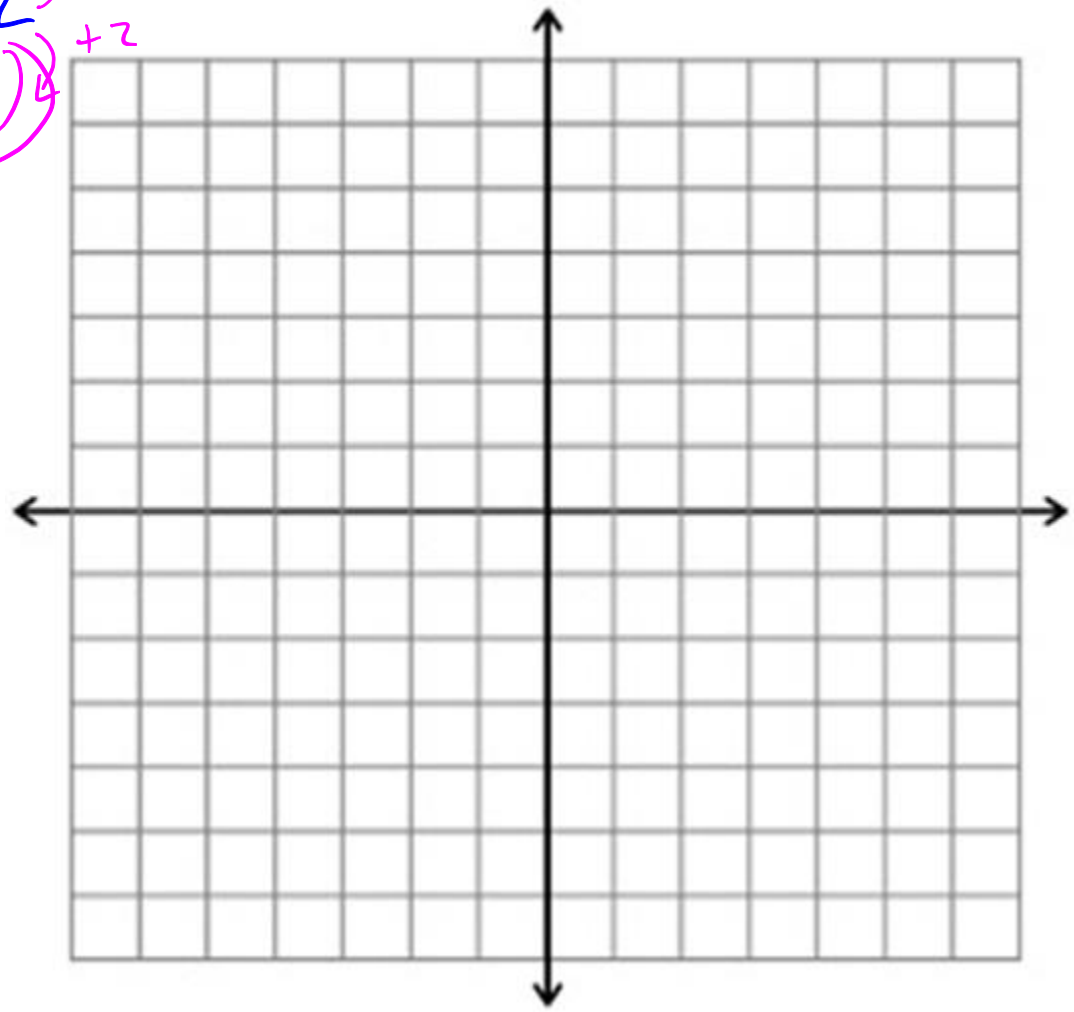
Notes

Reflect each of the following and state the new coordinates.

7) T(-4, 2) H(3, 1) A(5, -3) W(-3, -4) over the [redacted] YOU TRY!

$y = -2$

T'(-4, -6) H'(3, -5) A'(5, -1) W'(-3, 0)

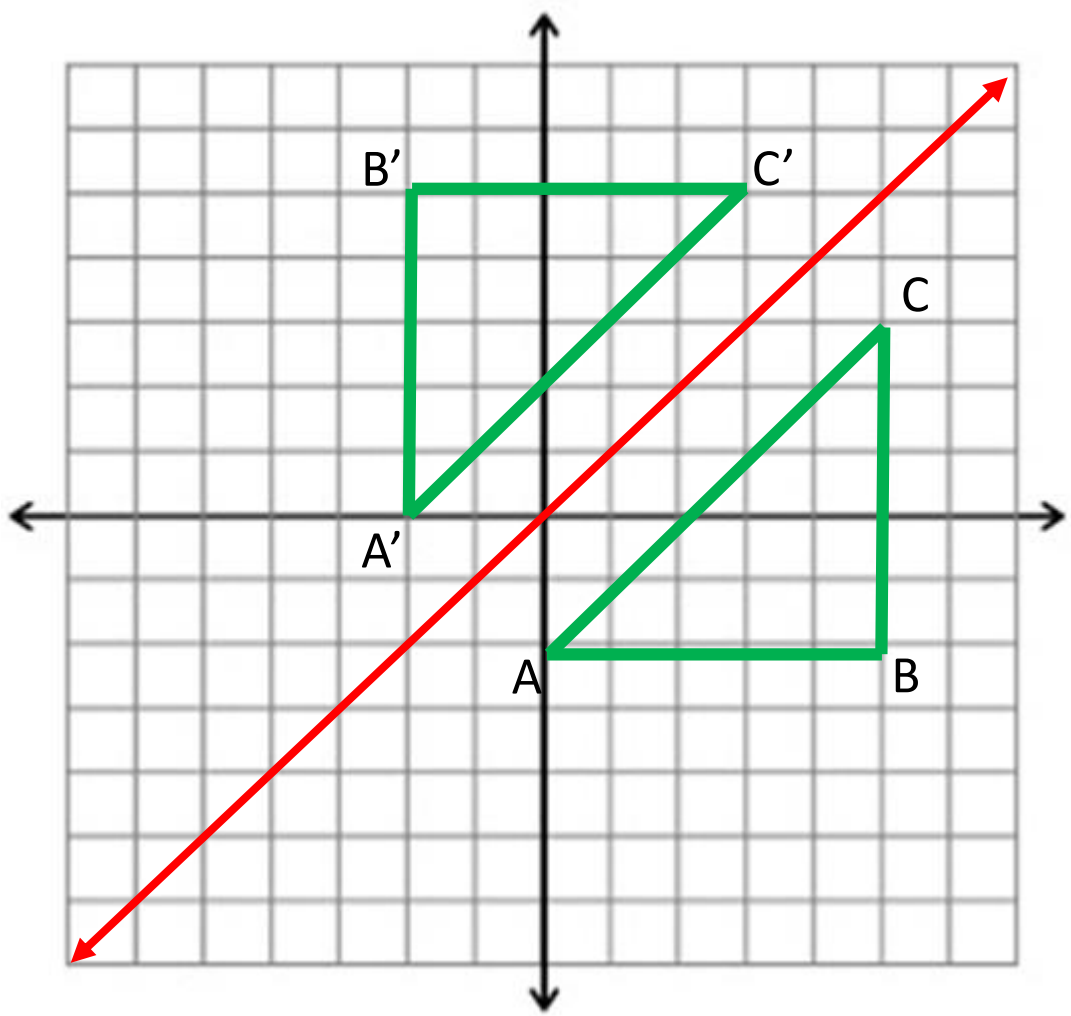


Notes - Rule for reflection across the line y=x.

Reflecting across the line y=x is a little trickier since it is diagonal.

A (0, -2) B (5, -2) C (5, 3)

A' (-2, 0) B' (-2, 5) C' (3, 5)



Notes

Using the rule for reflection across the line y=x, state the new coordinates.

8) S(-2, 4) N(3, 0) Q(-5, -4) E(2, -5)

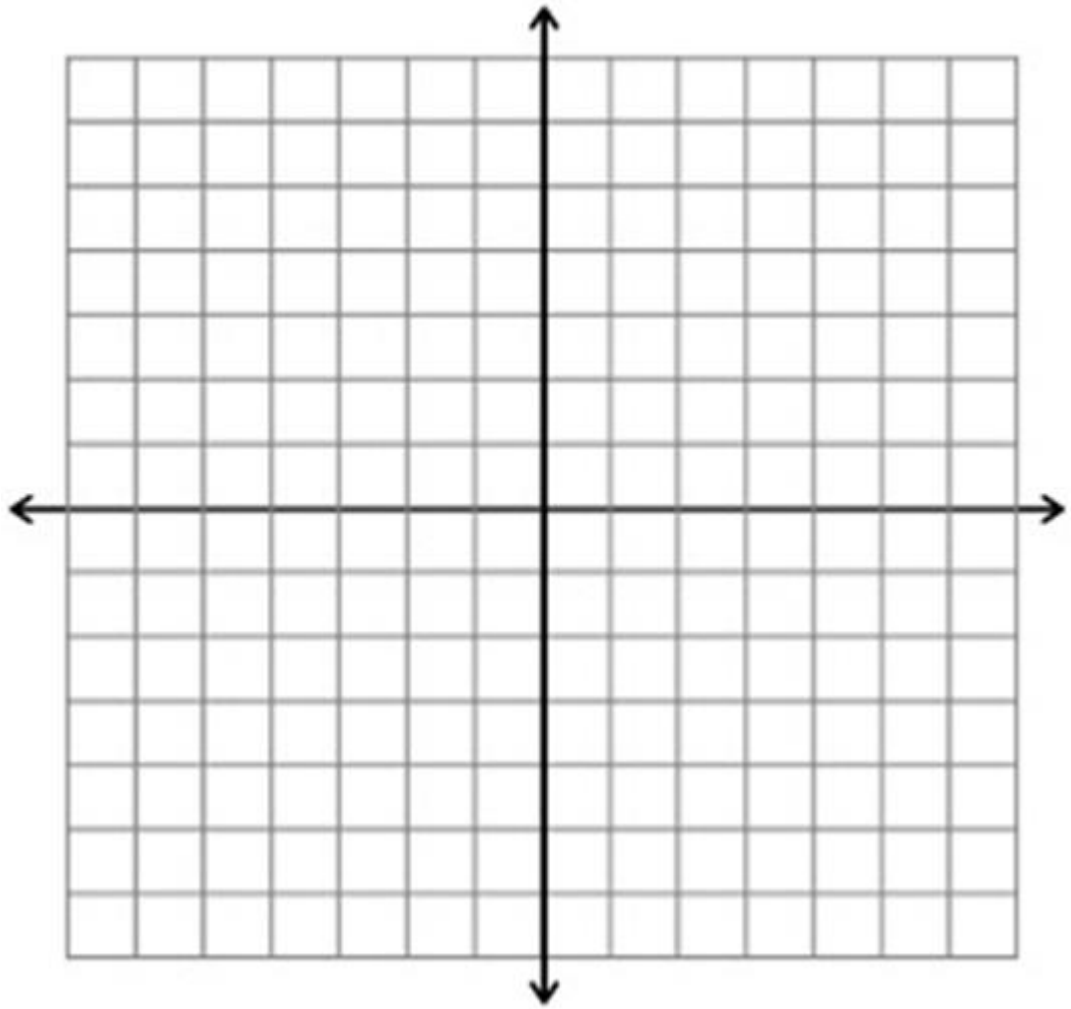
S'(4, -2) N'(0, 3) Q'(-4, -5) E'(-5, 2)

Notes

Graph the figure.

Transform across the line $x = 2$

$F(3,1)$, $A(2,-3)$, and $N(5,-2)$

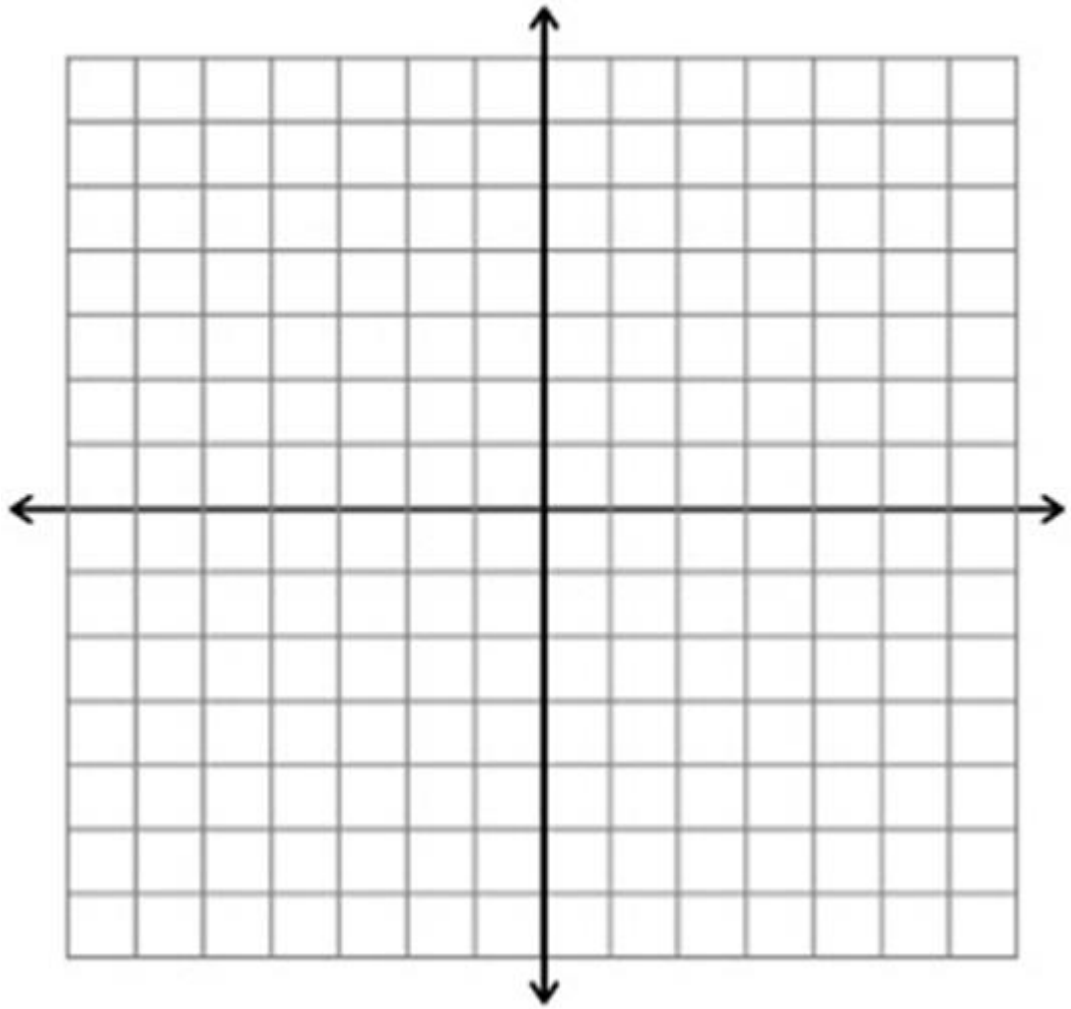


Notes

Graph the figure.

Transform across the line $y = 4$

C$(-1,4)$, $A(2,5)$, and $N(-3,1)$



Notes

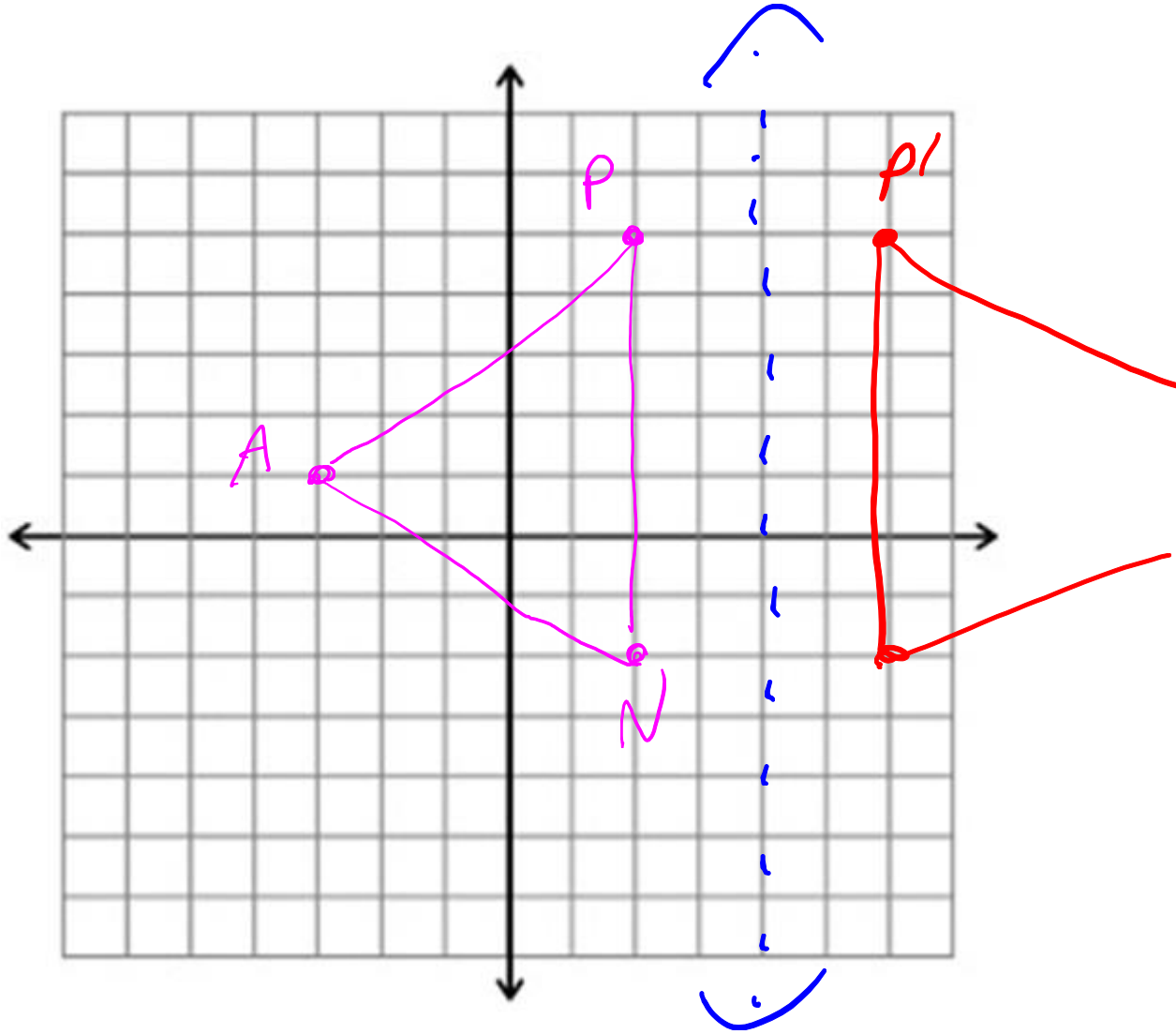
Graph the figure.

Transform across the line $x = 4$

P(2,5), $A(-3, 1)$, and $N(2, -2)$

4 4 4

P'(6,5) A'(11,1) N'(6,-2)



Notes

Graph the figure.

Transform across the line $y = 1$

B$(-2,4)$, U$(3,-1)$, and M$(-3,1)$