Day 1: Translations and Reflections

Day 2: Rotations

Day 3: Mixed Transformations

Day 4: NWEA

Day 5: Review

Day 6: Quiz-> in 30% because no retest

A **transformation** is a general term for four specific ways to manipulate the shape of a point, a line, or shape. The original shape of the object is called the pre-image and the final shape and position of the object is the image under the **transformation**.

Types of **transformations that maintain congruency**.
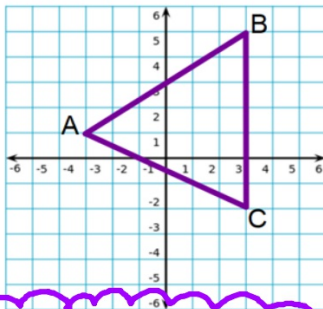Translation.
Reflection.
Rotation.

Types of transformations that maintain similarity
Dilations

Translation – moving the object by sliding it over and up without lifting the object

RULE $(x, y) \to (x+a, y+b)$ moves the figure to the right a units and up b units
This rule moves A to A', B to B' and C to C'

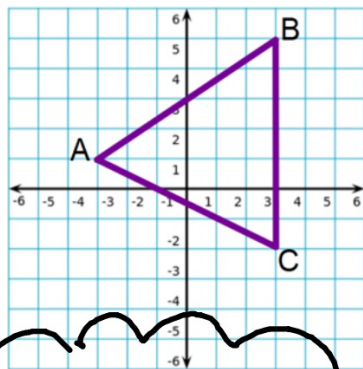| Example 1	Add 3 to each x-coordinate
	Subtract 2 from each y-coordinate
$(x, y) \to (x + 3, y - 2)$	A(-3, 1) A'(0, -1)
	B(3, 5) B'(6, 3)
	C(3, -2) C'(6, -4)
	Find the coordinates of the preimage and image. Sketch the image.

Example 2

$(x, y) \rightarrow (x - 1, y + 2)$

Subtract 1 to each x-coordinate
Add 2 to each y-coordinate
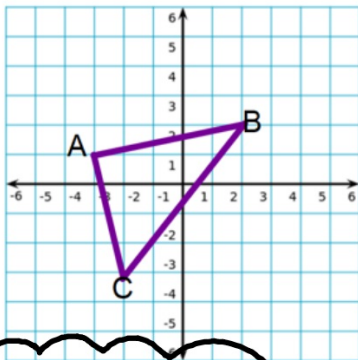
A(-3, 1)   A'(-4, 3)

B(3, 5)   B'(2, 7)

C(3, -2)   C'(2, 0)

Find the coordinates of the preimage and image.
Sketch the image

Example 3

$(x, y) \rightarrow (x, y + 4)$

___nothing___ to each x-coordinate

___Add 4___ to each y-coordinate
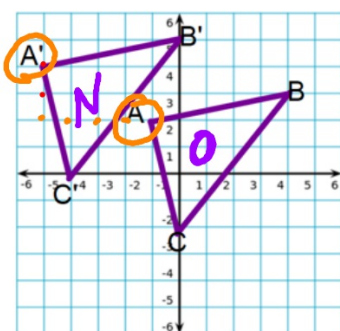
A(-3 , 1)   A'(-3 , 5)

B(2 , 2)   B'(2 , 6)

C(-2 , -3)   C'(-2 ,. 1)

Find the coordinates of the preimage and image.
Sketch the image.

Example 4
Write the rule for the translation from the preimage to the
Image.

A(,   )   A'(,   )
What happened to A to make A'
B(,   )   B'(,   )
Did the same thing happen to B to make B'?
Write the rule

$*$ (x, y) →(x __−4__ , y __+2__)
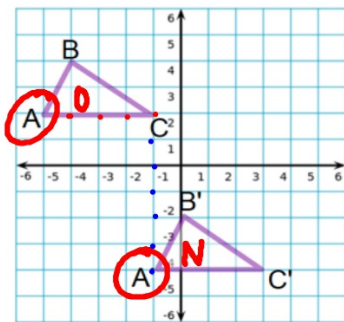
Check rule with C
C(,   )   C'(,   )

Example 5
Write the rule for the translation from the preimage to the
Image.

A(,   )   A'(,   )
What happened to A to make A'
B(,   )   B'(,   )
Did the same thing happen to B to make B'?
Write the rule

$*$ (x, y) →(x $+4$, y $- 6$)

Check rule with C
C(,   )   C'(,   )

A reflection can be thought of as folding or "flipping" an object over the line of reflection.

• The image is usually labeled using a *prime* symbol, such as *A'B'C'*.

• An object and its reflection have the same shape and size, but the figures face in opposite directions. The objects appear as if they are mirror reflections, with right and left reversed or the top and bottom reversed.
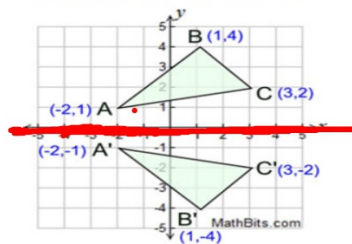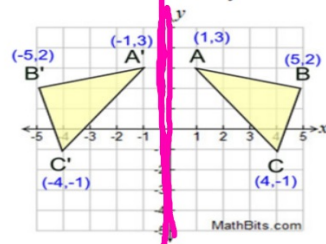
| Reflect over the x-axis:	When you reflect a point across the x-axis, the x-coordinate remains the same, but the y-coordinate is transformed into its opposite (its sign is changed).
B (1,4) C (3,2) (-2,1) A (-2,-1) A' C'(3,-2) B' (1,-4) MathBits.com	The reflection of the point (x,y) across the x-axis is the point $(x,-y)$.
Reflect over the y-axis:	When you reflect a point across the y-axis, the y-coordinate remains the same, but the x-coordinate is transformed into its opposite (its sign is changed).
(-1,3) A' (1,3) A (-5,2) B' (5,2) B C' (-4,-1) C (4,-1) MathBits.com	The reflection of the point (x,y) across the y-axis is the point $(-x,y)$.
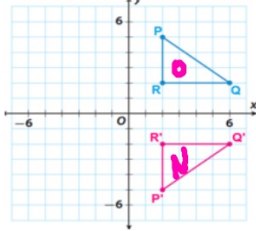
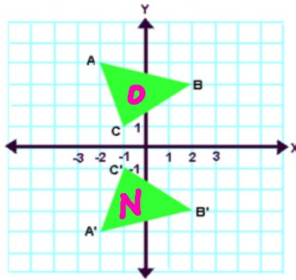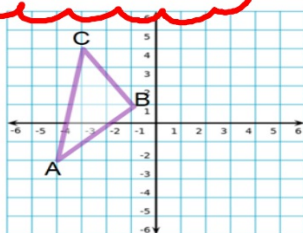| Example 1 Identify the transformation	Find the coordinates of the preimage and image.
reflected over the x-axis	P(,) P'(,) Q(,) Q'(,) R(,) R'(,)
Example 1 Identify the transformation	Identify the transformation.
reflected over the x axis	Find the coordinates of the preimage and image. A(,) A'(,) B(,) B'(,) C(,) C'(,)

Sketch the image of the triangle using the given rule.
Reflect across the y-axis

Label the coordinates.
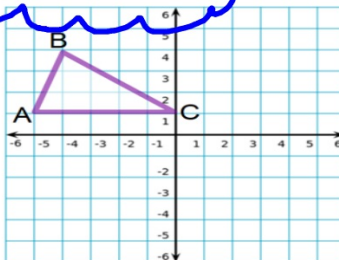Give the coordinates of both the preimage and the image.

A(**4** , **−2**) → A'(**4** , **−2**)

B(**−1** , **1**) → B'(**1** , **1**)

C(**−3** , **4**) → C'(**3** , **4**)

*change sign of X

Sketch the image of the triangle using the given rule.
Reflect over the x-axis

Label the coordinates.
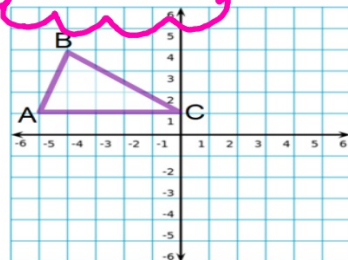Give the coordinates of both the preimage and the image.

A(**−5** , **1**) → A'(**−5** , **−1**)

B(**−4** , **4**) → B'(**−4** , **−4**)

C(**0** , **1**) → C'(**0** , **−1**)

*change sign of y

Sketch the image of the triangle using the given rule.
Reflect over the y-axis

Label the coordinates.
Label the coordinates.
Give the coordinates of both the preimage and the image.

A(**−5** , **1**) → A'(**5** , **1**)

B(**−4** , **4**) → B'(**4** , **4**)

C(**0** , **1**) → C'(**0** , **1**)

*change sign of X

Sketch the image of the triangle using the given rule.
Reflect over the x-axis

Label the coordinates.
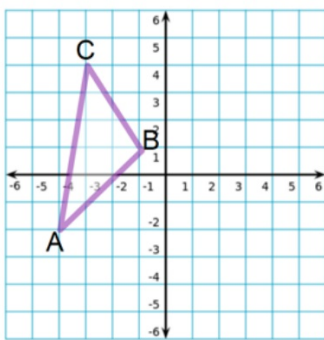Give the coordinates of both the preimage and the image.

A(,   )→A'(,   )

B(,   )→B'(,   )

C(,   )→C'(,   )