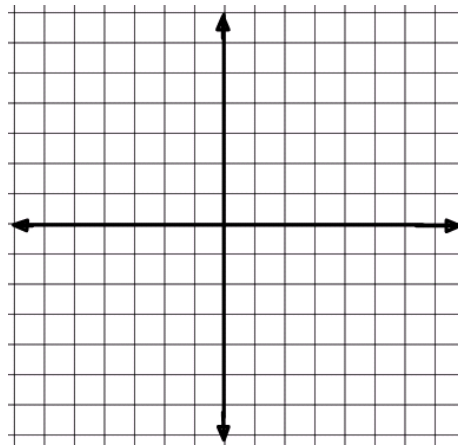


Section 4-3 Translations

Warm-up:

Complete the statements:

1. In Quadrant I, the x-values are _____ and the y-values are _____.
2. In Quadrant II, the x-values are _____ and the y-values are _____.
3. In Quadrant III, the x-values are _____ and the y-values are _____.
4. In Quadrant IV, the x-values are _____ and the y-values are _____.
5. Graph the following points and identify the shape. M(2,5), N(6,1), P(3,-2)

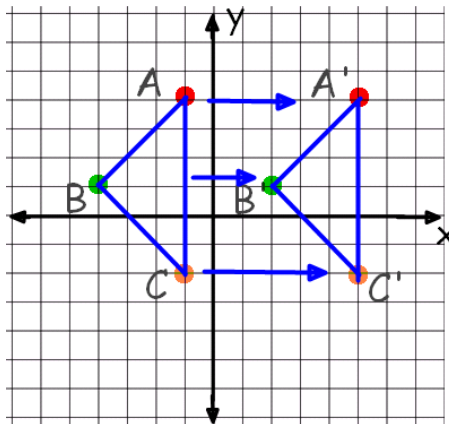


4-3 Translations

Translation: Moving every point in the figure a constant distance in a specified direction. Also referred to as “slide”.

Does not change the size or shape of the figure nor does it rotate or flip it.

Example



$$\triangle ABC \rightarrow \triangle A'B'C'$$

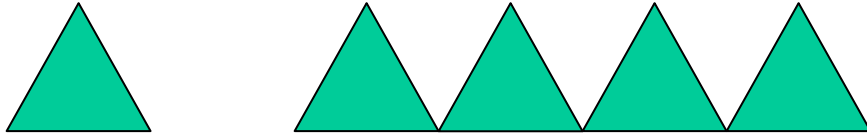
*the symbol for translation is \rightarrow

*A' is read as “A prime”...this distinguishes the original figure from the image new figure.

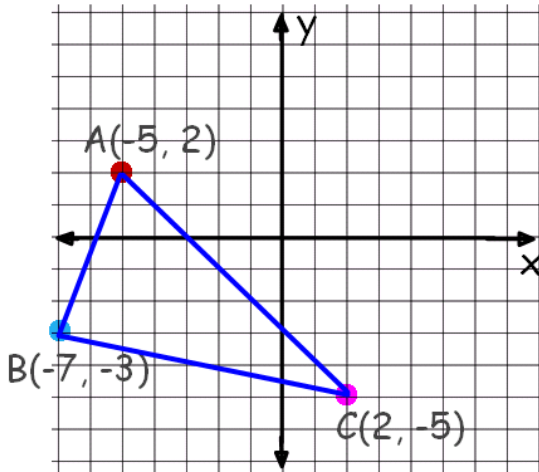
Translational symmetry: A symmetry that occurs when an object or pattern is translated creating copies of the original object or pattern.

Ex: object

design



Example 1: Translate $\triangle ABC$ 5 units right and 4 units up. What are the coordinates after the translation?



Solution

5 units right (add 5 to the x-values)

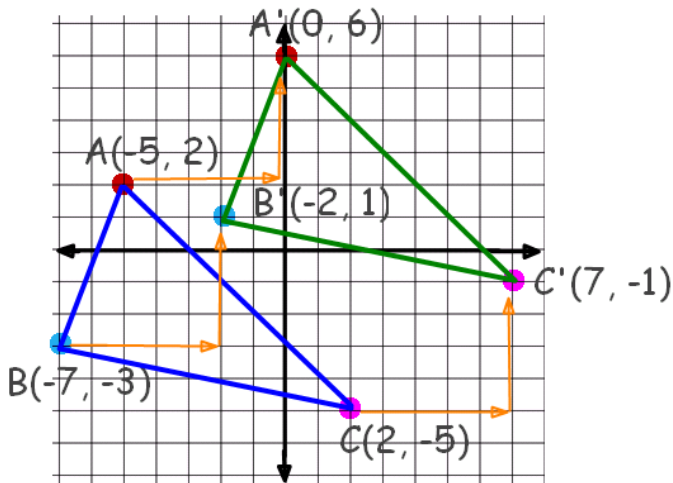
4 units up (add 4 to the y-value)

$A(-5, 2) \rightarrow A'(-5 + 5, 2 + 4)$ so $A'(0, 6)$

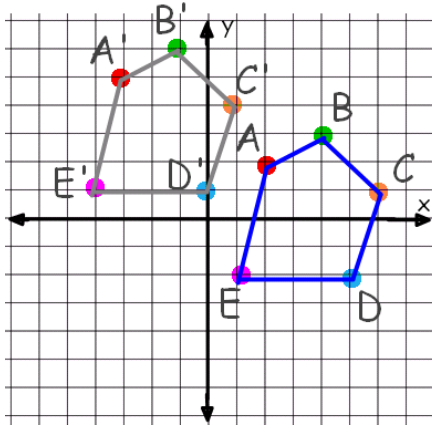
$B(-7, -3) \rightarrow B'(-2, 1)$

$C(2, -5) \rightarrow C'(7, -1)$

Now graph $\triangle A'B'C'$



Example 2: Tell whether the picture shows a translation. If so, describe how the vertices moved.



Solution

$$A(2, 2) \rightarrow A'(-3, 5)$$

$$B(4, 3) \rightarrow B'(-1, 6)$$

$$C(6, 1) \rightarrow C'(1, 4)$$

$$D(5, -2) \rightarrow D'(0, 1)$$

$$E(1, -2) \rightarrow E'(-4, 1)$$

The x-values all decreased by 5 and the y-values all increased by 3.
So yes, this is a translation. It is a translation of 5 units left and 3 units up.

Example 3: Describe each translation by showing the change in the coordinates (x, y) of any point.

- right 3 units and down 4 units
- left 6 units

Solution

a) 3 units right $\rightarrow x + 3$ down 4 units $\rightarrow y - 4$
so $(x, y) \rightarrow \boxed{(x+3, y-4)}$

b) 6 units left $\rightarrow x - 6$ no change to y...
so $(x, y) \rightarrow \boxed{(x-6, y)}$

Example 4: Write the coordinates of P' after each translation of P(-3, 5).

a) $(x, y) \rightarrow (x + 5, y - 4)$

b) $(x, y) \rightarrow (x, y + 6)$

Solution

a) $(-3, 5) \rightarrow (-3 + 5, 5 - 4)$
 $= \boxed{(2, 1)}$

b) $(-3, 5) \rightarrow (-3, 5 + 6)$
 $= \boxed{(-3, 11)}$

Homework:

Read pg. 197 – 199

Pg. 199 #4, 6-9, 11-14, 18-21, 32