

Section 2 – Topic 2

Examining and Using Translations

A **translation** "slides" an object a fixed distance in a given direction, preserving the same _____ and _____.

Suppose a geometric figure is translated h units along the x -axis and k units along the y -axis. We use the following notation to represent the transformation:

$$T_{h,k}(x, y) = (x + h, y + k) \text{ or } (x, y) \rightarrow (x + h, y + k)$$

- $(x, y) \rightarrow (x + 2, y - 5)$ translates the point (x, y) 2 units _____ and 5 units _____.

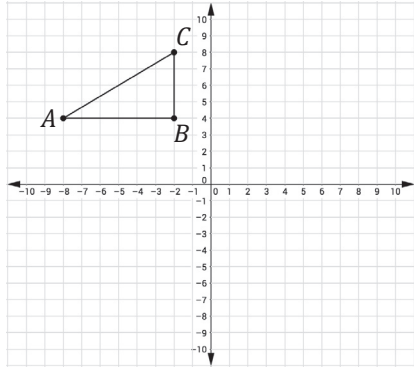
- What is the algebraic description for a transformation that translates the point (x, y) 2 units to the left and 3 units up?

- What is the algebraic description for a transformation that translates the point (x, y) 3 units to the right and 2 units down?



Let's Practice!

1. Transform triangle ABC according to $(x, y) \rightarrow (x + 3, y - 2)$. Write the coordinates for triangle $A'B'C'$.



$A'(\underline{\quad}, \underline{\quad})$

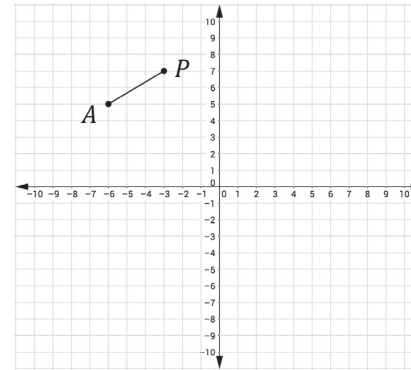
$B'(\underline{\quad}, \underline{\quad})$

$C'(\underline{\quad}, \underline{\quad})$

2. When the transformation $(x, y) \rightarrow (x + 10, y + 5)$ is performed on point A , its image, point A' , is on the origin. What are the coordinates of A ? Justify your answer.

Try It!

3. \overline{AP} undergoes the translation $T_{h,k}(x, y)$, such that $A'(1, 1)$ and $P'(4, 3)$.



- a. What are the values of h and k ?

$h = \underline{\quad}$ units

$k = \underline{\quad}$ units

- b. Which of the following statements is true?

- (A) \overline{AP} and $\overline{A'P'}$ have different locations.
- (B) \overline{AP} and $\overline{A'P'}$ have different shapes.
- (C) \overline{AP} and $\overline{A'P'}$ have different sizes.
- (D) \overline{AP} and $\overline{A'P'}$ have different directions.



BEAT THE TEST!

1. When the transformation $(x, y) \rightarrow (x - 4, y + 7)$ is performed on point P , its image is point $P'(-3, 4)$. What are the coordinates of P ?

- (A) $(-7, 11)$
- (B) $(-1, 3)$
- (C) $(1, -3)$
- (D) $(7, -11)$

2. Consider the following points.

$R(-6, 5)$ and $U(5, -6)$

\overline{RU} undergoes the translation $T_{h,k}(x, y)$, such that $R'(5, 1)$ and $U'(16, -10)$.

Part A: Complete the following algebraic description.

$$(x, y) \rightarrow (x + \boxed{}, y + \boxed{})$$

Part B: What is the difference between \overline{RU} and $\overline{R'U'}$?

