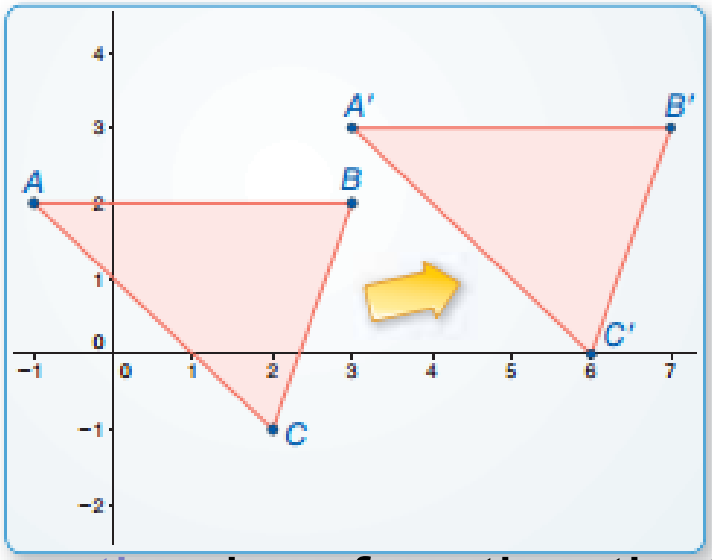
4.1 Translations



Slide or Shift

A transformation is a function that moves or changes a figure in some way to produce a new figure.

This new figure is called an image. A'

Another name for the original figure is the preimage. A

Writing a Translation Rule

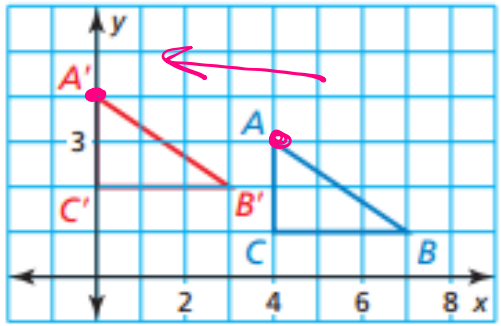
x + # → x − # ←

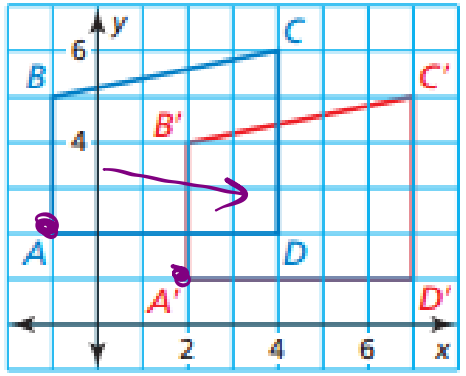
- To write a rule (x, y) is the preimage and (x + a, y + b) will give you the image.

y + # ↑ y − # ↓

- A belongs to the preimage and A' belongs to the image.

(x, y) → (x + 2, y − 3)





(x, y) → (x − 4, y + 1)

(x, y) → (x + 3, y − 1)

Composition of Transformations is when two or more transformations are combined to for a single transformation.

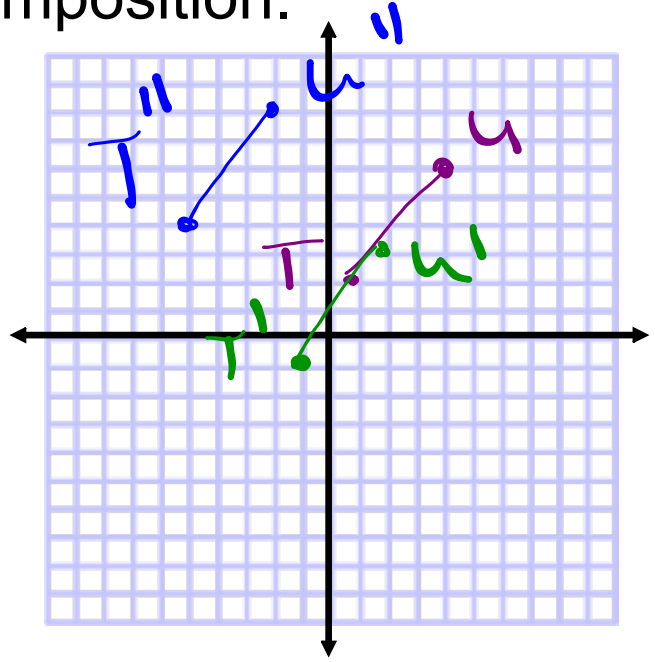
Example: Graph segment TU with endpoints T(1, 2) & U(4, 6) and its image after the composition.

Translation: (x - 2, y - 3)

Translation: (x - 4, y + 5)

$T''(-5, 4)$

$U''(-2, 8)$



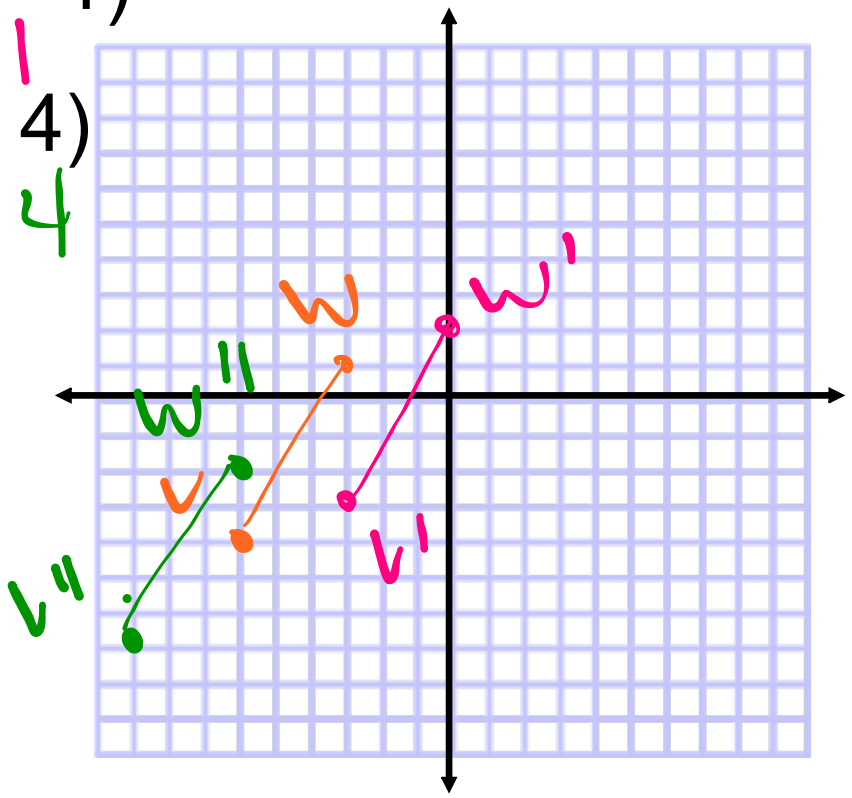
Practice: Graph segment VW with endpoints V(-6, -4) & W(-3, 1) and its image after the composition.

Translation: (x + 3, y + 1)

Translation: (x - 6, y - 4)

V''(-9, -7)

W''(-6, -2)



ACT Practice

If $\frac{x}{y} = \frac{1}{9}$ and $\frac{y}{z} = \frac{9}{8}$, then $\frac{z}{x} = ?$

A. $\frac{1}{648}$

B. $\frac{1}{8}$

C. $\frac{8}{81}$

D. $\frac{81}{8}$

E. 8

$\frac{9x}{9} = \frac{y}{9}$ $\quad x = \frac{y}{9}$

$\frac{8y}{9} = \frac{9z}{9}$ $\quad \frac{8}{9}y = z$

$\frac{\frac{8}{9}y}{\frac{y}{9}} = \frac{8y}{9} \cdot \frac{9}{y} = \frac{72y}{9y} = 8$

HW: pg. 178: 11, 13, 15, 21, 25, 43 - 50