

Honors Geometry Rigid Transformations

DATE: 10/18

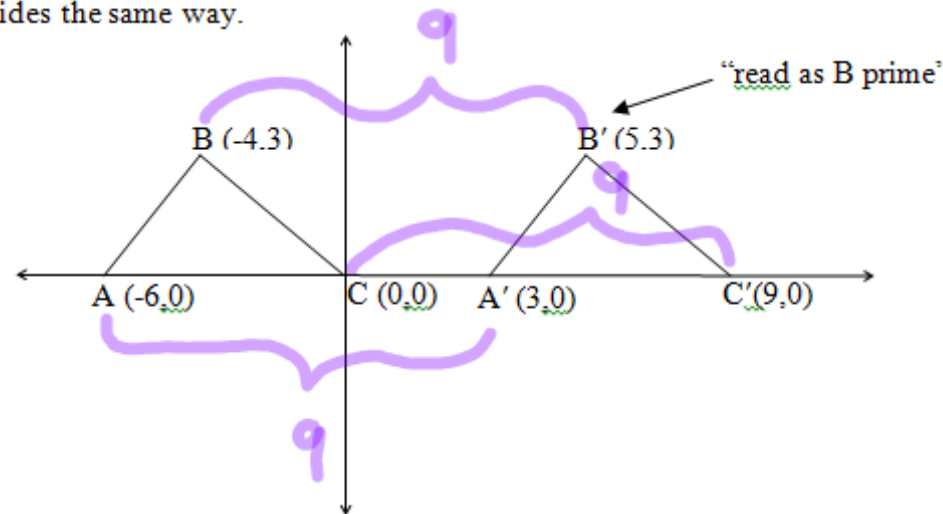
Target 2B. Perform rigid transformations: translation, reflection, and rotation

Introduction

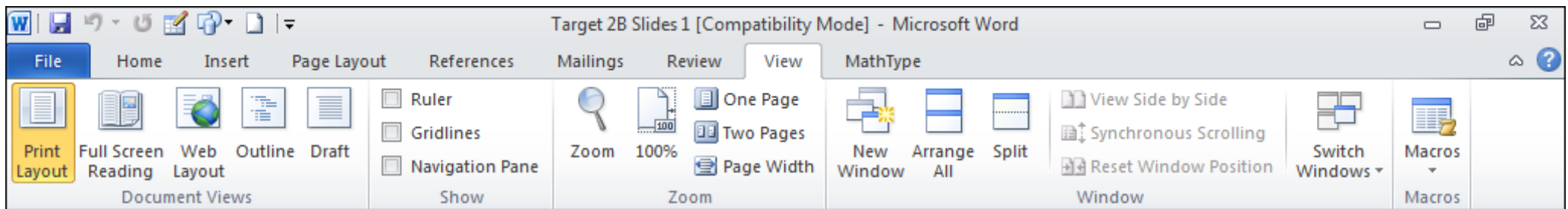
A rigid transformation (isometry) is a transformation that preserves the distance between every pair of points. In other words, a rigid transformation does not alter the size or shape of the figure. A rigid transformation occurs when you take a point or figure and move it by sliding it, reflecting it, or rotating it. The *original* figure is called the *pre-image* and the resulting figure is called the image.

Translations (Slides)

A slide is achieved by moving a figure a given distance and a given direction. Every point in the figure slides the same way.



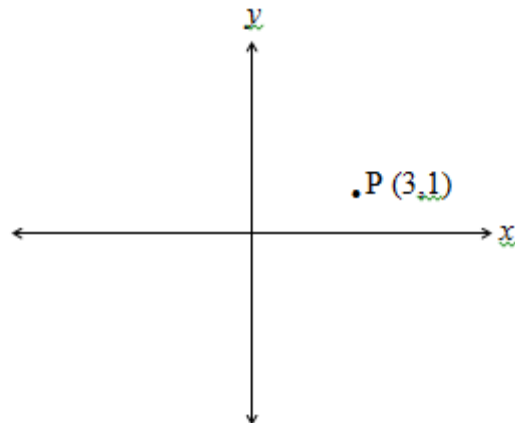
What is a rule for
this slide?
 $(x,y) \rightarrow (x+9,y)$
Why?



The slide above is achieved by sliding $\triangle ABC$ 9 to right. $\triangle ABC$ is pre-image. $\triangle A'B'C'$ is the image.

Example 1: Slide point P 5 units up. What are the coordinates of P'?

$$P'(3, 6)$$



The coordinates of P' are (3, 1).

The x-coordinate is 3.

The y-coordinate is 1.

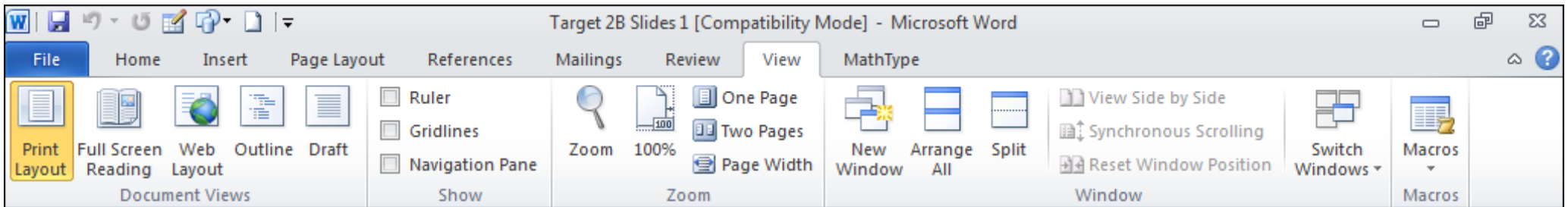
Write a rule to describe the translation of $P \rightarrow P'$.

$$(x, y) \rightarrow (x, y + 5)$$

$$P(3, 1) \rightarrow (3, 1 + 5) = (3, 6)$$

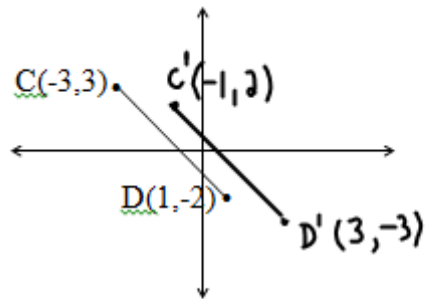
Remember: shift right/left is on X-AXIS. Shift up/down is on Y-AXIS.

Example 2: Slide \overline{CD} 2 units to the right and 1 unit down. Then write a rule to describe the



Example 2: Slide \overline{CD} 2 units to the right and 1 unit down. Then write a rule to describe the translation image of \overline{CD} .

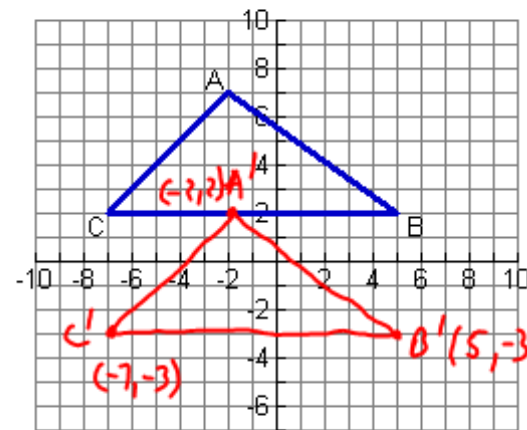
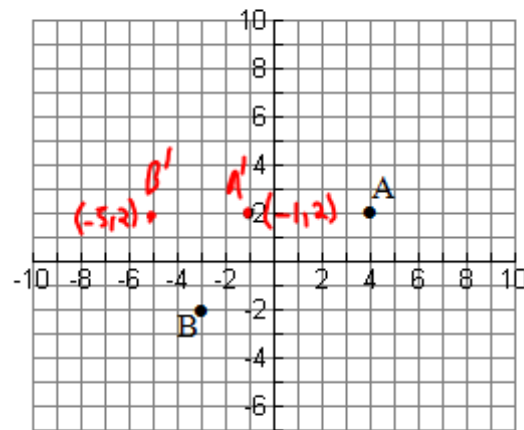
Rule: $(x, y) \rightarrow (x+2, y-1)$



Example 3: Slide each figure as indicated. Draw the new figure and write the coordinates of the image points.

- a. Slide A 5 units to the left.
Slide B 2 units to the left and 4 units up

- b. Slide $\triangle ABC$ 5 units down.



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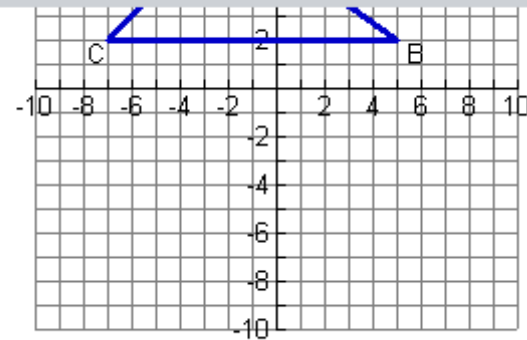
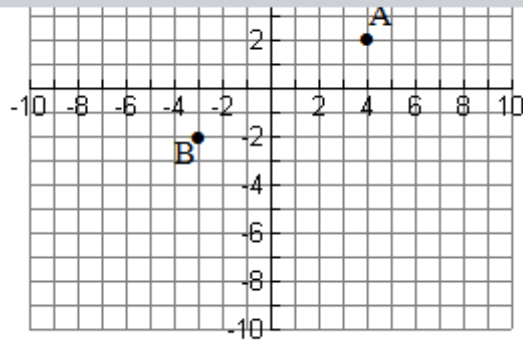
Ruler Gridlines Navigation Pane Show

Zoom 100% One Page Two Pages Page Width

New Window Arrange All Split Window

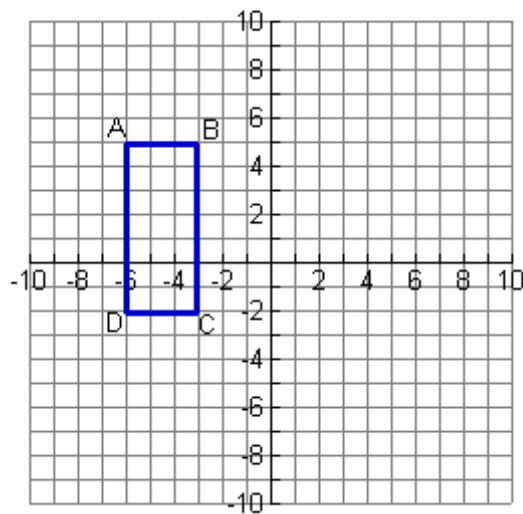
View Side by Side Synchronous Scrolling Reset Window Position

Switch Windows Macros

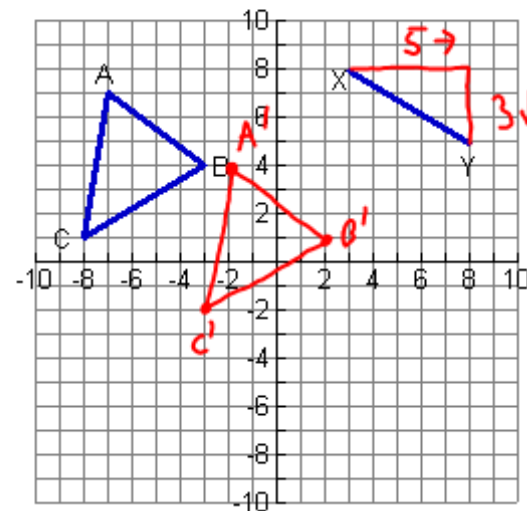


c. Slide ABCD 3 units to the right and 4 units down.

You try it!



d. Slide $\triangle ABC$ the same direction and distance as \overline{XY} .



You write the coordinates

*A'(,)
B'(,)
C'(,)*