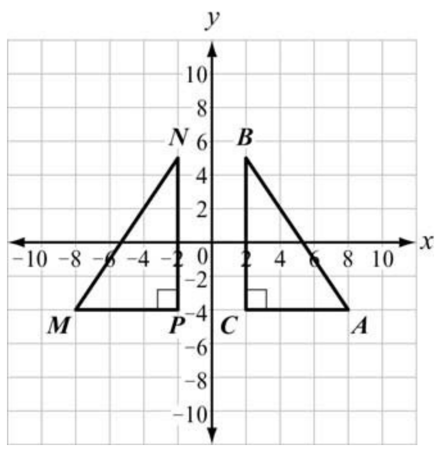
REVIEW EXAMPLES

1. Is $\triangle ABC$ congruent to $\triangle MNP$? Explain.



(scale unit = 2)

Solution:

$\overline{AC}$ corresponds to $\overline{MP}$. Both segments are 6 units long. $\overline{BC}$ corresponds to $\overline{NP}$. Both segments are 9 units long. Angle C (the included angle of $\overline{AC}$ and $\overline{BC}$) corresponds to angle P (the included angle of $\overline{MP}$ and $\overline{NP}$). Both angles measure 90°. Because two sides and an included angle are congruent, the triangles are congruent by SAS.

Or, $\triangle ABC$ is a reflection of $\triangle MNP$ over the y-axis. This means that all of the corresponding sides and corresponding angles are congruent, so the triangles are congruent. (Reflections preserve angle measurement and lengths; therefore, corresponding angles and sides are congruent.)

2. Rectangle *WXYZ* has coordinates *W*(1, 2), *X*(3, 2), *Y*(3, –3), and *Z*(1, –3).
   a. Graph the image of rectangle *WXYZ* after a rotation of 90° clockwise about the origin. Label the image *W′X′Y′Z′*.
   b. Translate rectangle *W′X′Y′Z′* 2 units left and 3 units up.
   c. Is rectangle *WXYZ* congruent to rectangle *W″X″Y″Z″* ? Explain.

Solution:

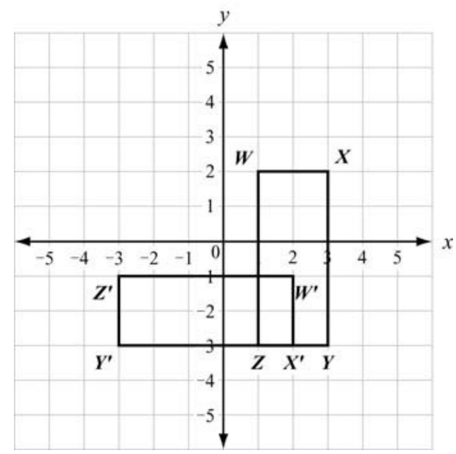
a. For a 90° clockwise rotation about the origin, use the rule $(x, y) \rightarrow (y, -x)$.

$W(1, 2) \rightarrow W'(2, -1)$

$X(3, 2) \rightarrow X'(2, -3)$

$Y(3, -3) \rightarrow Y'(-3, -3)$

$Z(1, -3) \rightarrow Z'(-3, -1)$



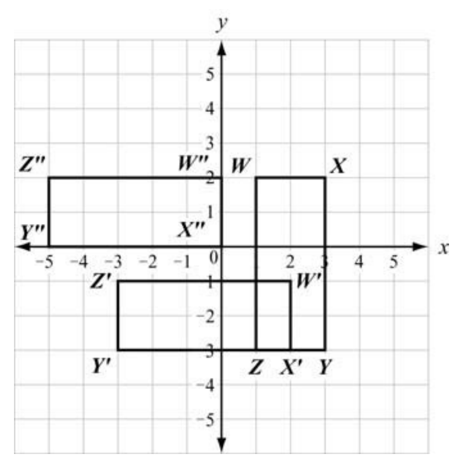
b. To translate rectangle *W′X′Y′Z′* 2 units left and 3 units up, use the rule $(x, y) \rightarrow (x - 2, y + 3)$.

$W'(2, -1) \rightarrow W''(0, 2)$

$X'(2, -3) \rightarrow X''(0, 0)$

$Y'(-3, -3) \rightarrow Y''(-5, 0)$

$Z'(-3, -1) \rightarrow Z''(-5, 2)$



c. Rectangle *W″X″Y″Z″* is the result of a rotation and a translation of rectangle *WXYZ*. These are both rigid transformations, so the shape and the size of the original figure are unchanged. All of the corresponding parts of *WXYZ* and *W″X″Y″Z″* are congruent, so *WXYZ* and *W″X″Y″Z″* are congruent.