9.5 Congruent Figures

Essential Question: What is the connection between transformations and figures that have the same shape and size?

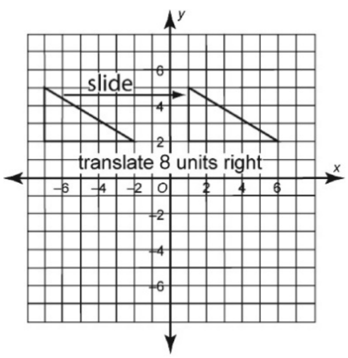
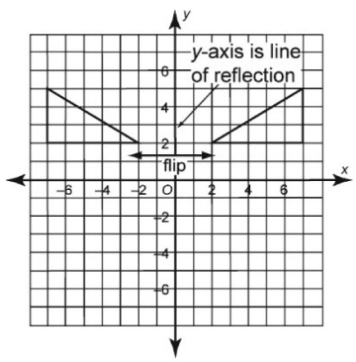
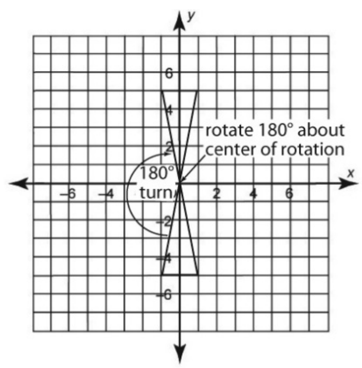
Learning Goal: Students will be able to understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. MAFS.8.G.1.2

Notes:

Congruent Figures

Recall that the segments and their images have the same length and angles and their images have the measure under a translation, reflection, and rotation. Two figures are said to be congruent if one can be obtained from the other by a sequence of translations, reflections, and rotations.
Congruent figures have the same size and shape.

How the positions change

<table>
<tr><th>Translation
Think: Slide</th><th>Reflection
Think: Flip over a line</th><th>Rotation
Think: Turn about a point</th></tr>
<tr><td>
</td><td>
</td><td>
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How the coordinates change

Translation Think: *Slide*	**Reflection** Think: *Flip*	**Rotation** Think: *Turn*
$(x, y) \rightarrow (x + a, y + b)$ translates left or right a units and up or down b units	$(x, y) \rightarrow (-x, y)$ reflects across the y-axis $(x, y) \rightarrow (x, -y)$ reflects across the x-axis	$(x, y) \rightarrow (-x, -y)$ rotates 180° around origin $(x, y) \rightarrow (y, -x)$ rotates 90° clockwise around origin $(x, y) \rightarrow (-y, x)$ rotates 90° counterclockwise around origin