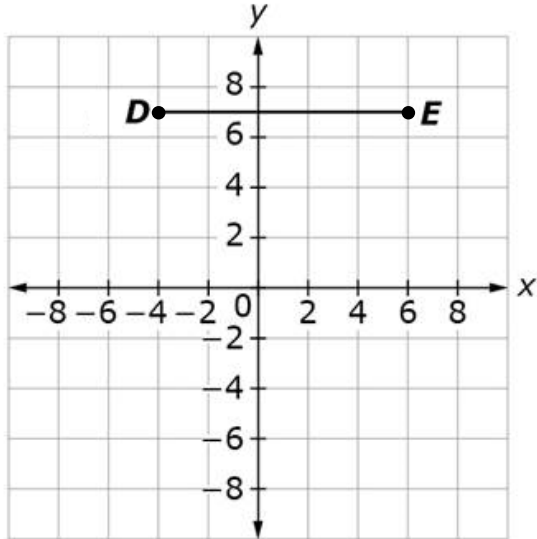


<p>Task Model 1</p> <p>Response Type: Equation/Numeric</p> <p>DOK Level 1</p> <p>8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.</p> <p>Evidence Required: 1. The student verifies that rigid transformations preserve distance and angle measures.</p> <p>Tools: Calculator</p>	<p>Prompt Features: The student is prompted to give a length or angle measure in a geometric figure after one rigid transformation.</p> <p>Stimulus Guidelines:</p> <ul style="list-style-type: none"> • The distance formula should not be needed to find the length of the line segment. • Angle measurements should be less than 180°. • Item difficulty can be adjusted via these example methods: <ul style="list-style-type: none"> ○ Vary the type and number of transformations. ○ Provide graphics that illustrate the transformation. ○ Provide verbal descriptions of the transformation. ○ The length of an original line segment is provided or student calculates the length from coordinates. ○ The measure of an original angle is provided or student determines the angle measure. <p>TM1a Stimulus: The student is presented with an image or description of a geometric object and one rigid transformation.</p> <p>Example Stem 1: Line segment DE is translated left 3 units and down 2 units to form line segment $D'E'$.</p> <div style="text-align: center;">  </div> <p>Enter the distance, in units, between point D' and point E'.</p> <p>Example Stem 2: Line segment FG begins at $(-2, 4)$ and ends at $(-2, -3)$. The segment is translated left 3 units and up 2 units to form line segment $F'G'$.</p> <p>Enter the length, in units, of line segment $F'G'$.</p> <p>Rubric: (1 point) The student gives the correct measure (e.g., 10; 7).</p> <p>Response Type: Equation/Numeric</p>
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Task Model 1

Response Type:
Matching Tables

DOK Level 1

8.G.A.1

Verify experimentally the properties of rotations, reflections, and translations:

- a. Lines are taken to lines, and line segments to line segments of the same length.
- b. Angles are taken to angles of the same measure.
- c. Parallel lines are taken to parallel lines.

Evidence Required:

- 1. The student verifies that rigid transformations preserve distance and angle measures.

Tools: Calculator

Accessibility Note:

Presenting the coordinate plane without a grid and without tick marks, as suggested in the Stimulus Guidelines for varying difficulty, is not an accessibility issue for this particular task model given the purpose of the item.

Prompt Features: The student is prompted to verify that rigid transformations result in congruent figures.

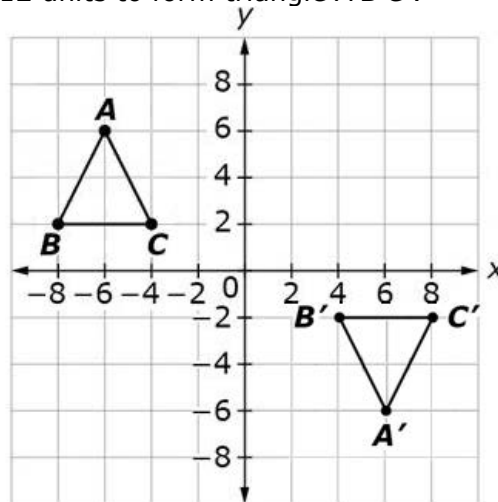
Stimulus Guidelines:

- The distance formula should not be needed to find the length of the line segment.
- Angle measurements should be less than 180° .
- Item difficulty can be adjusted via these example methods:
 - Vary the type and number of transformations
 - Vary the figure used
 - Having three options: True, False, Cannot be determined
 - Presenting the coordinate plane without grid and without tick marks

TM1b

Stimulus: The student is presented with two congruent figures on a coordinate plane and a description of a transformation.

Example Stem: Triangle ABC is reflected across the x -axis and then translated right 12 units to form triangle $A'B'C'$.



Select True or False for each statement.

Statement	True	False
Angle B has the same measure as angle B' .		
Side AC is longer than side $A'C'$.		
Side BC is the same length as side $B'C'$.		

Rubric: (1 point) The student correctly identifies all statements as True or False (e.g., T, F, T).

Response Type: Matching Tables

Task Model 1

Response Type:
Matching Tables

DOK Level 1

8.G.A.1

Verify experimentally the properties of rotations, reflections, and translations:

- a. Lines are taken to lines, and line segments to line segments of the same length.
- b. Angles are taken to angles of the same measure.
- c. Parallel lines are taken to parallel lines.

Evidence Required:

- 1. The student verifies that rigid transformations preserve distance and angle measures.

Tools: Calculator

Prompt Features: The student is prompted to match corresponding parts of figures after a rotation, reflection, and/or translation has been applied to a figure.

Stimulus Guidelines: Item difficulty can be adjusted via these example methods:

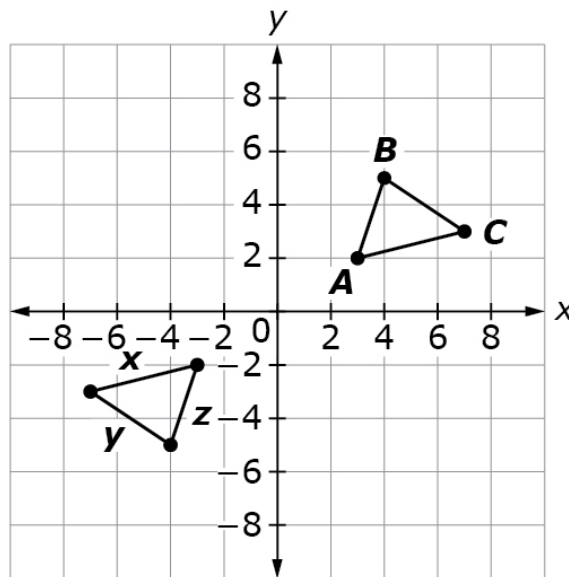
- Varying the type and number of transformations
- Varying the figure
- Providing graphics that illustrate the transformation
- Providing verbal descriptions of the transformation

TM1c

Stimulus: The student is presented with two congruent figures on a coordinate plane and a description of a transformation.

Example Stem: Triangle ABC was created by joining points $A(3, 2)$, $B(4, 5)$, and $C(7, 3)$ with line segments.

Triangle ABC is reflected over the x -axis and then reflected over the y -axis to form a triangle with side lengths x , y , and z .



Click in the table to show which side lengths are equal.

	x	y	z
AB			
AC			
BC			

Rubric: (1 point) The student correctly matches the sides of both triangles (e.g., $AB = z$, $AC = x$, $BC = y$).

Response Type: Matching Tables

Task Model 2

Response Type:
Matching Tables

DOK Level 2

8.G.A.2

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.

8.G.3

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Evidence Required:

2. The student describes sequences of rotations, reflections, translations, and dilations that can verify whether two-dimensional figures are similar or congruent to each other.

Tools: Calculator

Prompt Features: The student is prompted to verify that two figures are similar or congruent by describing a sequence of rotations, reflections, translations, and dilations that exhibit the similarity or congruence between two given figures.

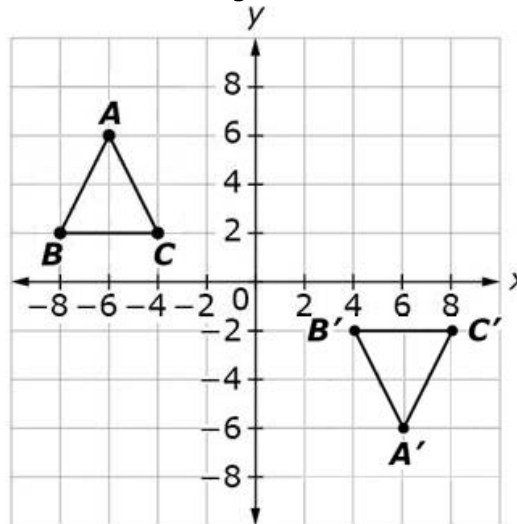
Stimulus Guidelines:

- A figure will contain no more than eight vertices.
- Item difficulty can be adjusted via these example methods:
 - Varying the type and number of transformations
 - Inclusion of dilations.

TM2

Stimulus: Transformations will include rotation, reflection, dilation, and/or translation.

Example Stem: Consider this figure.



Consider the statements in the table shown. Select True or False for each statement about the sequences of transformations that can verify that triangle ABC is congruent to triangle $A'B'C'$.

Statement	True	False
Triangle ABC is translated 12 units to the right, followed by a reflection across the x -axis.		
Triangle ABC is a reflected across the y -axis, followed by a translation 12 units down.		
Triangle ABC is reflected across the x -axis, followed by a translation 12 units to the right.		

Rubric: (1 point) The student selects True or False for the correct sequence of transformations for the figure (e.g., T, F, T).

Response Type: Matching Tables

<p>Task Model 3</p> <p>Response Type: Graphing</p> <p>DOK Level 2</p> <p>8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p>Evidence Required: 3. The student constructs a new figure after the original figure is dilated, rotated, reflected, or translated.</p> <p>Tools: Calculator</p> <p>Accessibility Note: Graphing items are not currently able to be Brailled. Minimize the number of items developed to this TM.</p>	<p>Prompt Features: The student draws the image of a figure after a single rotation, reflection, translation, or dilation.</p> <p>Stimulus Guidelines:</p> <ul style="list-style-type: none"> • A figure will contain no more than eight vertices. • Item difficulty can be adjusted via these example methods: <ul style="list-style-type: none"> ○ Varying the type and number of transformations ○ Inclusion of dilations ○ Number of vertices <p>TM3</p> <p>Stimulus: The student is presented with a figure on a coordinate plane and a verbal description of a single rotation, reflection, translation, or dilation.</p> <p>Example Stem: The figure on the coordinate plane is reflected across the y-axis.</p> <div data-bbox="678 772 1247 1344" data-label="Figure"> <p>The figure shows a coordinate plane with a grid. The x-axis and y-axis both range from -8 to 8, with major grid lines every 2 units. A triangle is drawn in the second quadrant. The vertices of the triangle are labeled with their coordinates: the top vertex is at (-6, 7), the bottom-left vertex is at (-8, 3), and the bottom-right vertex is at (-4, 3). The x-axis is labeled 'x' and the y-axis is labeled 'y'.</p> </div> <p>Use the Connect Line tool to draw the resulting image of the figure.</p> <p>Interaction: The student uses the Connect Line tool to draw a figure on a grid. The Add Point and Delete button should also be available. The grid should have snap functions at every intersection of grid lines.</p> <p>Rubric: (1 point) The student draws the triangle in the correct location.</p> <p>Response Type: Graphing</p>
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Task Model 4

Response Type:
Hot Spot

DOK Level 2

8.G.A.3

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Evidence Required:

4. The student describes the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Tools: Calculator

Accessibility Note:

Hot spot items are not currently able to be Brailled. Minimize the number of items developed to this TM.

Prompt Features: The student is prompted to give the coordinates of the image of a given point or set of points (or the quadrant that one or more coordinates is located in) after a sequence of transformations.

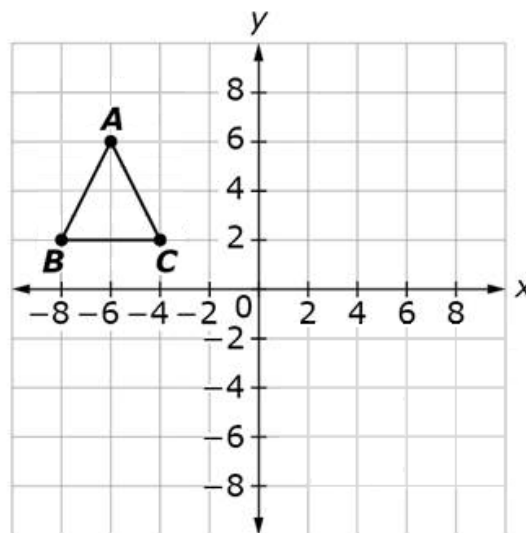
Stimulus Guidelines:

- Transformations can include rotation, reflection, translation, and dilation.
- A figure should contain no more than eight vertices.
- Item will ask for the coordinates of a point in the image of the figure after the transformation is applied, up to a maximum of three points.
- Item difficulty can be adjusted via these example methods:
 - Varying the type and number of transformations
 - Inclusion of dilations
 - Number of vertices on figure
 - Number of coordinates that must be supplied by student.

TM4

Stimulus: The student is presented with a figure on a coordinate plane, along with a description of a sequence of transformations.

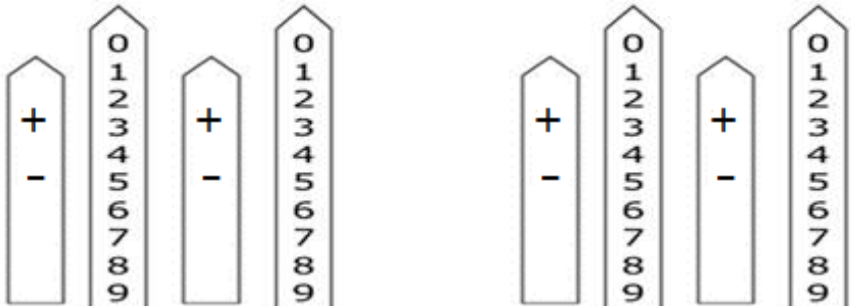
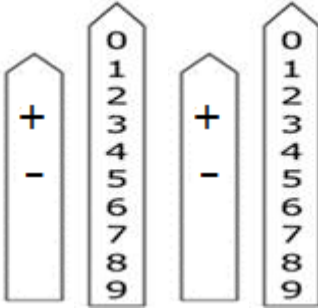
Example Stem: Triangle ABC is reflected across the x -axis, and dilated by a scale factor of 2, with the origin as the center of the dilation.



Click the numbers to give the coordinates of vertices $A'B'C'$.

Interaction: The student will click on numbers and positive/negative signs to give coordinates.

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<p>Task Model 4</p> <p>Response Type: Hot Spot</p> <p>DOK Level 2</p> <p>8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p>Evidence Required: 4. The student describes the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p> <p>Tools: Calculator</p> <p>Accessibility Note: Hot spot items are not currently able to be Brailled. Minimize the number of items developed to this TM.</p>	<p>$A'=(\quad , \quad)$ $B'=(\quad , \quad)$</p>  <p>$C'=(\quad , \quad)$</p>  <p>Rubric: (1 point) The student identifies all 3 points correctly. (e.g., $A' = (-12, -12)$, $B' = (-16, -4)$, $C' = (-8, -4)$).</p> <p>Response Type: Hot Spot</p>
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