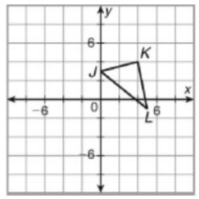
Unit 4 Transformations

Grade: High-School Mathematics - Geometry

Course: GEOMETRY	**Learning Goal:** Students will be able to represent transformations in the coordinate plane. Describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not.	
Standards: MAFS.912.G-CO.1.2, CO.1.3, CO.1.4, CO.1.5, CO.2.6 MAFS.912.G-SRT.1.1, 1.2		**Student Evidences**
4	Students can apply and make connections to the real world of transformations & prove theorems through technology and project-based activities.	□ I can use real-world situations applied to transformations using technology for project design.
3	Students can demonstrate mastery of graphing and describing Translations, reflections, rotations, and dilations. Describe and perform congruence transformations and similarity transformations. Specify a sequence of transformations that will carry a given figure onto another. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure.	□ I can determine the scale factor of dilations. □ I can differentiate between the transformations that are considered rigid motion and those that are not. □ I can describe the transformation rules of translations, reflections, rotations, and dilations. □ I can graph transformations rules of translations, reflections, rotations, and dilations.
2	Students can recalling specific vocabulary terms such as transformation, translation, reflection, rotation, reflection, rigid motion, similarity, congruence.	□ I can recall specified definitions of vocabulary terms. □ I can identify & differentiate between transformations of rigid motion. □ I can differentiate between reflections, translations, rotations, and dilations.
1	Students can graph ordered pairs (coordinates) on the coordinate plane accurately.	□ I can graph ordered pairs on the coordinate plane. □ I can solve proportions. □ I know the difference between similar and congruent figures.

MAFS.912.G-CO.1.2/1.4 Sample Question

ΔJKL is rotated 90° about the origin and then translated using $(x, y) \rightarrow (x - 8, y + 5)$. What are the coordinates of the final image of point L under this composition of transformations?

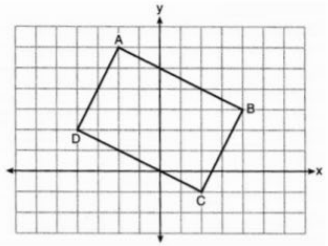


Given: $\overline{AB}$ with coordinates of $A(-3, -1)$ and $B(2, 1)$
$\overline{A'B'}$ with coordinates of $A'(-1, 2)$ and $B'(4,4)$

Which translation was used?

MAFS.912.G-CO.1.5 Sample Question

Quadrilateral ABCD is graphed on the set of axes below.



When ABCD is rotated 90° in a counterclockwise direction about the origin, its image is quadrilateral A' B 'C 'D'. Is distance preserved under this rotation, and which coordinates are correct for the given vertex?

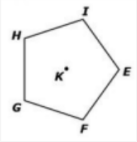
MAFS.912.G-SRT.1.1/1.2 Sample Question

The coordinates of trapezoid EFGH are E(4, 8), F(1, 2), G(6, 1), and H(8, 8). The image of EFGH under dilation is E'F'G'H'.

If the coordinates of vertex E' are (1, 2), what are the coordinates of vertex H'? Justify your response by demonstrating how you determined the scale factor and in using that to determine coordinates of H'.

MAFS.912.G-CO.1.3 Sample Question

Regular pentagon EFGHI with center K is shown.



Select all the transformations that carry pentagon EFGHI onto itself.

Answer Options:

A. a reflection across line EK, a 180° counterclockwise rotation about point K, and a reflection across a vertical line through point K.

B. a 90° counterclockwise rotation about point E, a reflection across line FG, and a vertical translation.

C. a reflection across line FI, a reflection across line GH, and a 180° clockwise rotation about point K.

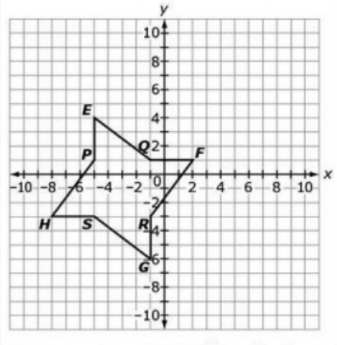
D. a reflection across a vertical line through point K, a 180° clockwise rotation about point K, and a reflection across line EK.

E. a 180° clockwise rotation about point E, a reflection across a vertical line through point E, and a reflection across a horizontal line through point E

MAFS.912.G-CO.2.6 Sample Question

Question:

Evelyn is designing a pattern for a quilt using polygon EQFRGSHP shown.



Evelyn transforms EQFRGSHP so that the impage of E is at (2,0) and the image of R is at (6,-7). Which transformation could Evelyn have used to show EQFRGSHP and its image are congruent?

Answer Options:

A. EQFRGSHP was reflected over the line y = x +2.

B. EQFRGSHP was translated right 7 units and down 4 units.

C. EQFRGSHP was rotated 135 degrees clockwise about the point Q.

D. EQFRGSHP was rotated 90 degrees clockwise about the point (-3,-1).