

Geometry · Rigid Transformations · Test Answer Key

Common Core G-CO.A.2, G-CO.A.3, G-CO.A.4, G-CO.A.5 · mathovore.fr

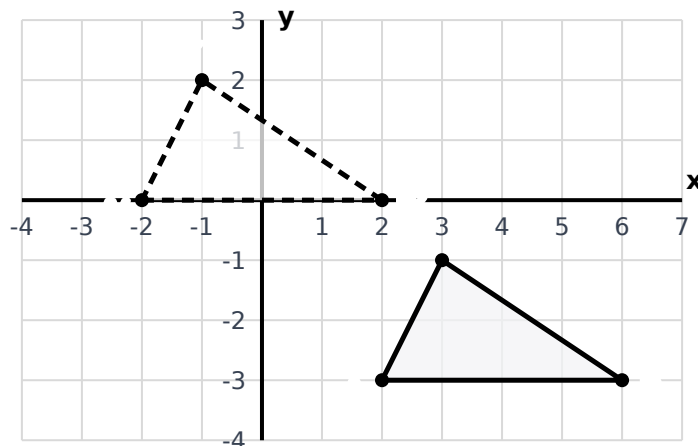
This answer key gives complete solutions and a point-by-point scoring guide for the rigid transformations test. Accept any valid sequence for the open-ended questions and award partial credit as described.

GeometryCommon Core: G-CO.A.2 · G-CO.A.3 · G-CO.A.4 · G-CO.A.5

Question 1: Translate a triangle (2 points)

Subtract 4 from each x-coordinate and add 3 to each y-coordinate.

$$A'(-2, 0), B'(2, 0), C'(-1, 2).$$



Pre-image (solid) and image (dashed).

Scoring: 2 points if all three vertices are correct; 1 point if two are correct.

Question 2: Reflect over $y = x$ (2 points)

Reflection over $y = x$ swaps the coordinates of each point.

$$J'(-4, 1), K'(-1, 1), L'(-4, 4).$$

Scoring: 2 points if all three are correct; 1 point if two are correct.

Question 3: Rotate clockwise (2 points)

A 90° clockwise rotation sends (x, y) to $(y, -x)$.

- a. $(2, -3)$
- b. $(5, 4)$
- c. $(-6, 0)$

Scoring: 1 point for two correct images; 2 points for all three.

Question 4: Sequence of transformations (3 points)

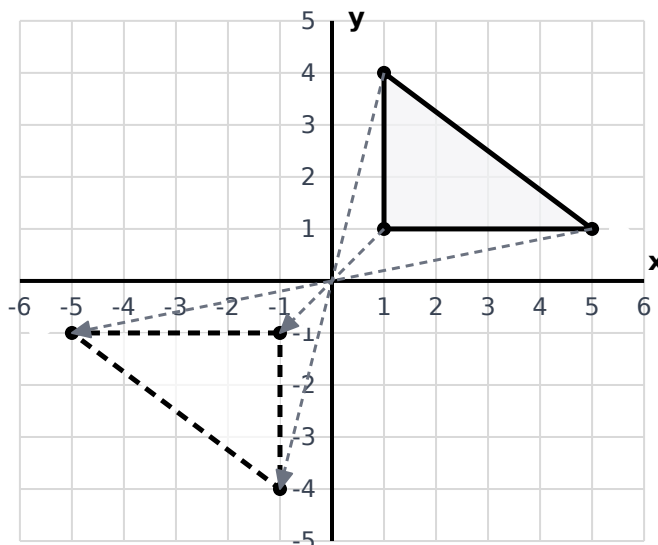
- a. Reflection over the y-axis: $D'(-1, 2)$, $E'(-4, 2)$, $F'(-1, 6)$. Translation: $D''(1, -1)$, $E''(-2, -1)$, $F''(1, 3)$.
- b. $DE = 4 - 1 = 3$ and $D''E'' = 1 - (-2) = 3$. The lengths are equal, as expected for rigid transformations.

Scoring: Part (a): 1 point for the correct intermediate image, 1 point for the final image. Part (b): 1 point for both lengths.

Question 5: Identify the transformation (2 points)

Each point (x, y) goes to $(-x, -y)$, for example $A(1, 1)$ to $A'(-1, -1)$.

The transformation is a **rotation of 180° about the origin**.



Each vertex and its image lie on a line through the origin.

Scoring: 1 point for naming a rotation (a reflection over both axes in turn is also accepted); 1 point for the angle 180° and the center at the origin.

Question 6: Rigid or not rigid (2 points)

- a. $AB = 4 - 1 = 3$. The image endpoints are $A'(1, 3)$ and $B'(1, 12)$, so $A'B' = 12 - 3 = 9$.
b. **No**. The length changed from 3 to 9, and rigid transformations preserve length.

Scoring: 1 point for both lengths; 1 point for the conclusion with the reason.

Question 7: Symmetry (3 points)

- a. **8 lines**: a regular polygon with n sides has n lines.
b. $360 \div 8 = 45$: 45° .
c. **2 lines**, one through the midpoints of each pair of opposite sides.

Scoring: 1 point per correct part.

Question 8: Describe a sequence (2 points)

One answer: rotate 180° about the origin, then translate by $\langle -1, 4 \rangle$.

Rotation: $A'(6, -1)$, $B'(2, -1)$, $C'(2, -3)$, $D'(6, -3)$. Translation: $A''(5, 3)$, $B''(1, 3)$, $C''(1, 1)$, $D''(5, 1)$, which match the image.

Scoring: 1 point for a correct first transformation; 1 point for a second transformation that completes the mapping. Other valid sequences earn full credit.

Question 9: Robot position (2 points)

Reflection over the x-axis: $(-3, 4)$ becomes $(-3, -4)$.

Translation: $(-3+5, -4+2) = (2, -2)$.

Scoring: 1 point for the reflected point; 1 point for the final position.

Total
20 points