

Moving Shapes with Translations, Reflections, Rotations

Grade 8 math · Test · Standards: 8.G.A.1, 8.G.A.3

Name: _____ Date: _____ Class: _____

This test covers translations, reflections, and rotations on the coordinate plane. It has 8 questions worth 20 points and should take about 45 minutes. Show every vertex you compute, and use a ruler when you sketch a figure.

Standards: 8.G.A.1, 8.G.A.3 · **Level:** Grade 8

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Points on the plane (2 points)

Point M is at $(-3, 5)$.

- Translate M by 6 units right and 8 units down. (1 point)
- Reflect M across the x -axis. (1 point)

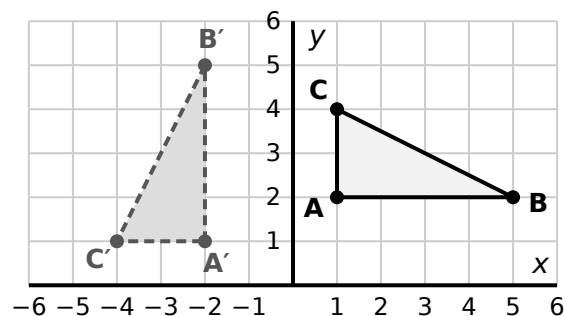
Question 2 Rotations of a point (3 points)

Point N is at $(4, -6)$. Find its image after each rotation about the origin.

- 90° counterclockwise (1 point)
- 180° (1 point)
- 270° counterclockwise (1 point)

Question 3 Identify the motion (3 points)

The figure shows $\triangle ABC$ and its image $\triangle A'B'C'$.



Triangle ABC and its image.

- a. Name the transformation. (1 point)
- b. Write a coordinate rule for it. (1 point)
- c. State two properties that are the same in both triangles. (1 point)

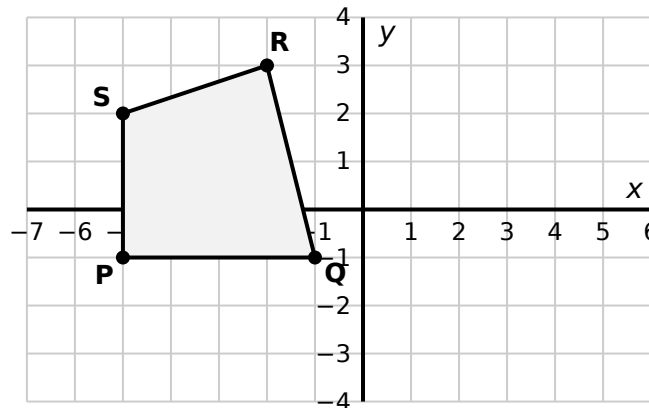
Question 4 Rigid motion properties (2 points)

A triangle with side lengths 6 in., 8 in., and 10 in. is rotated 90° about the origin.

- a. Give the side lengths and the largest angle measure of the image. (1 point)
- b. Is the image congruent to the original triangle? Explain. (1 point)

Question 5 Two moves on a quadrilateral (3 points)

Quadrilateral PQRS is shown. It is reflected across the x-axis and then translated 7 units right and 3 units up.



Quadrilateral PQRS.

- a. Find the vertices after the reflection. (1 point)
- b. Find the vertices of the final image. (2 points)

Question 6 Find the rule (2 points)

Under one transformation, $(-3, 4)$ maps to $(3, -4)$ and $(5, -1)$ maps to $(-5, 1)$. Name the transformation and write its rule.

Question 7 Does order matter? (2 points)

Point $(-2, 5)$ goes through two programs. Program A: rotate 90° counterclockwise about the origin, then translate 4 units right. Program B: translate 4 units right, then rotate 90° counterclockwise about the origin. Find both final points.

Question 8 Robotics mat (3 points)

A robotics club mat uses coordinates in feet. A robot starts at $(-5, 3)$. Its program reflects the position across the y-axis, rotates it 180° about the origin, and then translates it 4 feet right and

6 feet down.

- a. Find the robot's final position. (2 *points*)
- b. The first two steps together equal one reflection. Name it. (1 *point*)