

# Grade 8 · Translations, Reflections and Rotations · Quiz

Common Core 8.G.A.1, 8.G.A.3 · mathovore.fr

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Score: \_\_\_\_\_

Ten multiple-choice questions check translations, reflections and rotations on the coordinate plane and the properties of rigid motions for standards 8.G.A.1 and 8.G.A.3. Rotations are counterclockwise about the origin. Pick one answer each, then read the explanations.

**Grade 8 Common Core: 8.G.A.1 · 8.G.A.3**

## Questions

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### Question 1

What is the image of  $(2, -3)$  under the translation  $(x, y) \rightarrow (x - 4, y + 5)$ ?

- A.  $(6, -8)$
- B.  $(-2, 2)$
- C.  $(-2, -8)$
- D.  $(6, 2)$

### Question 2

What is the image of  $(-5, 3)$  after a reflection across the  $x$ -axis?

- A.  $(5, 3)$
- B.  $(5, -3)$
- C.  $(-5, -3)$
- D.  $(3, -5)$

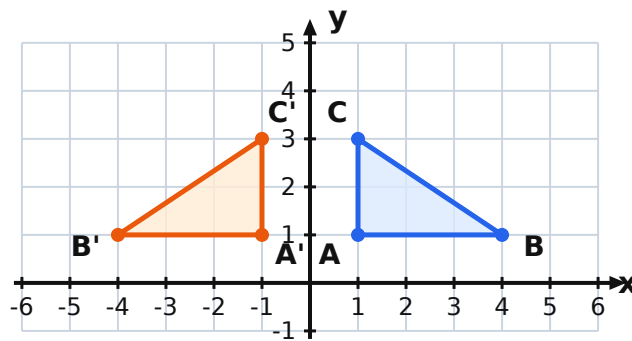
### Question 3

What is the image of  $(4, 1)$  after a  $90^\circ$  counterclockwise rotation about the origin?

- A.  $(1, -4)$
- B.  $(-4, -1)$
- C.  $(-1, 4)$
- D.  $(-4, 1)$

#### Question 4

Which single motion maps triangle  $ABC$  onto triangle  $A'B'C'$ ?



Triangle  $ABC$  and its image.

- A. Reflection across the x-axis
- B. Reflection across the y-axis
- C. Rotation of 180 degrees about the origin
- D. Translation 5 units left

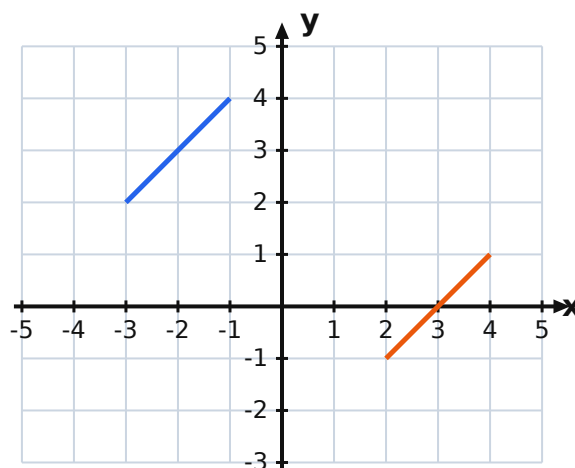
#### Question 5

Which measures stay the same when a figure is rotated about the origin?

- A. Only side lengths
- B. Side lengths and angle measures
- C. Only angle measures
- D. Neither side lengths nor angle measures

#### Question 6

The figure shows a translation. Which rule describes it?



A segment with endpoint  $A(-3, 2)$  and its image with endpoint  $A'(2, -1)$ .

- A.  $(x,y) \rightarrow (x+5, y+3)$
- B.  $(x,y) \rightarrow (x-5, y-3)$
- C.  $(x,y) \rightarrow (x+3, y-5)$
- D.  $(x,y) \rightarrow (x+5, y-3)$

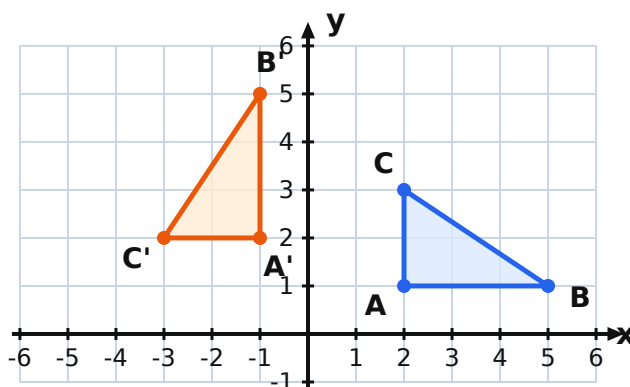
### Question 7

Which rule describes a rotation of  $180^\circ$  about the origin?

- A.  $(x,y) \rightarrow (-y,x)$
- B.  $(x,y) \rightarrow (y,-x)$
- C.  $(x,y) \rightarrow (-x,-y)$
- D.  $(x,y) \rightarrow (-x,y)$

### Question 8

Triangle  $A'B'C'$  is a counterclockwise rotation of triangle  $ABC$  about the origin. What is the angle of rotation?



Triangle  $ABC$  and its image.

- A.  $180^\circ$
- B.  $270^\circ$
- C.  $45^\circ$
- D.  $90^\circ$

### Question 9

Two parallel lines are reflected across the  $x$ -axis. What is true about their images?

- A. They are parallel.
- B. They are perpendicular.
- C. They cross at the origin.
- D. They are no longer parallel.

### Question 10

A triangle has a side of 9 cm and an angle of  $45^\circ$ . It is rotated  $270^\circ$  about the origin. What are

the side and angle of the image?

- A. 9 cm and  $45^\circ$
- B. 9 cm and  $315^\circ$
- C. 18 cm and  $45^\circ$
- D. 9 cm and  $135^\circ$

## Answer key

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1. **B** – Subtract 4 from x:  $2 - 4 = -2$ . Add 5 to y:  $-3 + 5 = 2$ . The wrong choices mix up the signs.
2. **C** – A reflection across the x-axis changes the sign of y only. Changing x gives the reflection across the y-axis.
3. **C** – Use (x, y) to (-y, x). The choice (1, -4) is the 270 degree rotation.
4. **B** – A(1, 1) goes to A'(-1, 1): only the x-coordinate changes sign. A translation would shift both triangles by the same amount, but B goes to -4 while A goes to -1.
5. **B** – Rotations are rigid motions, so they keep both lengths and angles. The image is congruent to the pre-image.
6. **D** – From A(-3, 2) to A'(2, -1): x increases by 5 and y decreases by 3. The wrong rules change a sign or swap the numbers.
7. **C** – A 180 degree rotation negates both coordinates. The second and third rules are 90 and 270 degree rotations, and the last is a reflection.
8. **D** – A(2, 1) goes to A'(-1, 2), which matches (x, y) to (-y, x), the 90 degree rule.
9. **A** – Reflections are rigid motions, and rigid motions keep parallel lines parallel.
10. **A** – Rotations keep lengths and angle measures. The angle of rotation is not added to the angle of the triangle.

### Remember:

- Rigid motions keep segment lengths, angle measures and parallel lines, so the image is congruent to the pre-image.
- Translation: (x, y) becomes (x + a, y + b).
- Reflection across the x-axis: (x, -y). Across the y-axis: (-x, y).
- Rotation about the origin, counterclockwise: 90 degrees (-y, x), 180 degrees (-x, -y), 270 degrees (y, -x).
- The image of point A is written A prime.