

Geometry - Symmetry of Polygons and Rigid Motions - Test

Common Core G-CO.A.3, G-CO.B.6 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This 45-minute test checks line and rotational symmetry and the preservation of distance and angle. It has 9 questions worth 20 points in total. Show every step of the work, label diagrams, and include units where they apply. Calculators are allowed unless the teacher says otherwise.

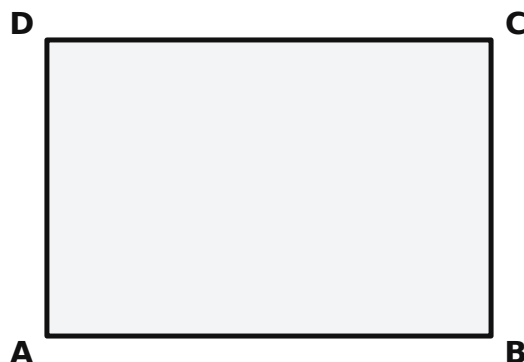
About this test

- Grade: Geometry
- Chapter: Symmetry of Polygons and Rigid Motions
- Standards: G-CO.A.3, G-CO.B.6
- Time: 45 minutes
- Total: 20 points

Question 1 - Nonagon symmetry [2 pts]

A regular nonagon has 9 sides. Find its number of lines of symmetry and its smallest rotation angle.

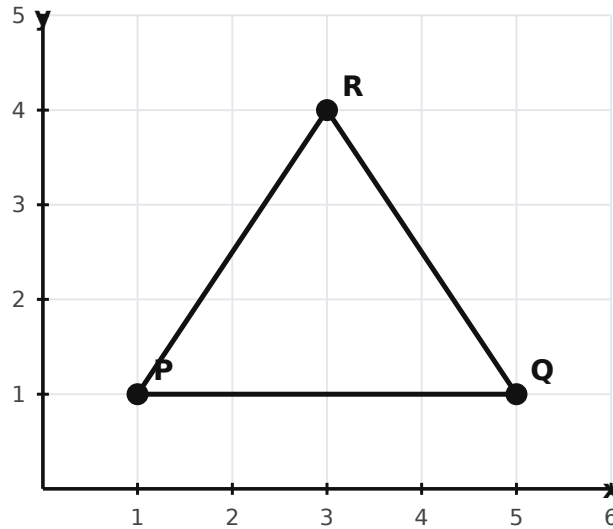
Question 2 - Rectangle symmetries [2 pts]



Rectangle ABCD.

List every rigid motion (rotations less than 360° and reflections) that maps this non-square rectangle onto itself.

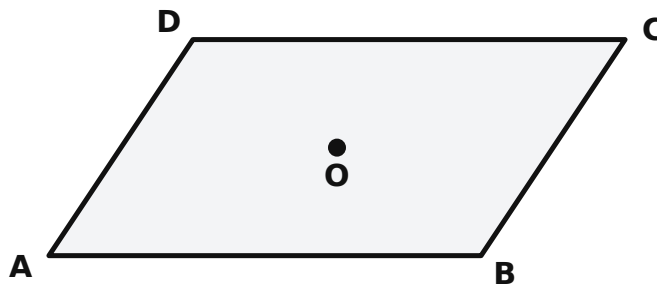
Question 3 - Isosceles triangle [3 pts]



Triangle PQR.

- Show that $PR = QR$. (1 point)
- Show that the line $x = 3$ is a line of symmetry of the triangle by finding the image of each vertex. (2 points)

Question 4 - Rotation without reflection [2 pts]



Parallelogram ABCD.

The parallelogram has no right angles and unequal adjacent sides. Describe a rotation that maps it onto itself and explain why no reflection does.

Question 5 - Preserved measures [2 pts]

Triangle ABC has $AB = 9$, $BC = 12$ and $m\angle B = 90^\circ$. A rotation maps it to triangle DEF. Find DE, EF and $m\angle E$, and compute the length of the hypotenuse DF.

Question 6 - 15-gon [3 pts]

A regular polygon has 15 sides. Find the number of lines of symmetry, the smallest rotation angle, and the number of different rotations (including 360°) that map it onto itself.

Question 7 - Square vertices [2 pts]

A square has vertices $(4, 0)$, $(0, 4)$, $(-4, 0)$ and $(0, -4)$. Find where the rotation $(x, y) \rightarrow (-y, x)$ sends each vertex, and state whether it is a symmetry of the square.

Question 8 - Letters [2 pts]

The capital letters H, N, S and Z are drawn in a standard block style. Which have rotational symmetry of 180° ? Which have a horizontal line of symmetry?

Question 9 - Fan blades [2 pts]

A ceiling fan has 5 evenly spaced blades. Find the angle between neighboring blades and list the rotations less than 360° that make the fan look the same.