LESSON MAKER PRO

Symmetry Spotters

Find reflections, turns, and slides that match.

HIGH SCHOOL · MA.912.GR.2.4

MA.912.GR.2.4 "Determine symmetries of reflection, symmetries of rotation and symmetries of translation of a geometric figure."

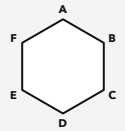
NAME _____ DATE _____

MATCH THE FIGURE

A reflection symmetry flips a figure across a line and makes the figure match itself. A rotation symmetry turns a figure about its center and makes it match itself. A repeating pattern can have translation symmetry when a nonzero slide makes the pattern match again.

WORKED EXAMPLE

Use the regular hexagon. Find its number of reflection symmetries and its smallest positive rotation symmetry.



1. A regular hexagon has 6 equal sides.
2. It has 6 reflection lines through matching parts.
3. 360° / 6 = 60°.

Answer: 6 reflection symmetries; 60°

PRACTICE 4 problems

1 A non-square rectangle has how many reflection symmetries? What is its smallest positive rotation symmetry?

ANSWER _____

2 An equilateral triangle has how many reflection symmetries? What is its smallest positive rotation symmetry?

ANSWER _____

3 A floor pattern matches again after a slide 4 units right and 3 units down. Write the translation rule.

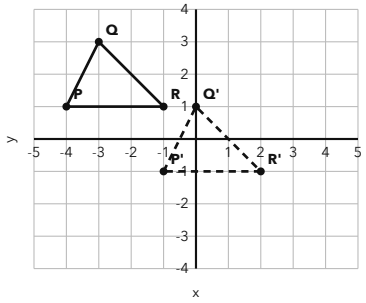
ANSWER _____

4 A regular heptagon has how many reflection symmetries? What is its rotational order?

ANSWER _____

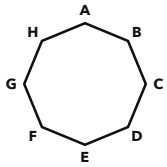
APPLY IT Show your work

1 A game designer repeats a triangular icon. The solid icon and dashed icon show one repeat. Write the translation rule.



ANSWER _____

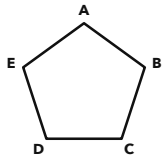
2 A student designs a regular octagonal pin. How many reflection symmetries does the pin have, and what is its smallest positive rotation symmetry?



ANSWER _____

CHALLENGE One step up

Use the regular pentagon. State its number of reflection symmetries, its rotational order, and whether it has a nonzero translation symmetry. Explain.



WORK SPACE AND ANSWER

ANSWER KEY

Symmetry Spotters

HIGH SCHOOL · MA.912.GR.2.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A non-square rectangle has how many reflection symmetries? What is its smallest positive rotation symmetry?	**2 reflection symmetries; 180°**
2	An equilateral triangle has how many reflection symmetries? What is its smallest positive rotation symmetry?	**3 reflection symmetries; 120°**
3	A floor pattern matches again after a slide 4 units right and 3 units down. Write the translation rule.	**(x, y) → (x + 4, y - 3)**
4	A regular heptagon has how many reflection symmetries? What is its rotational order?	**7 reflection symmetries; rotational order 7**

PART 2 · APPLY IT

1. **(x, y) → (x + 3, y - 2)** Compare matching vertices. Each vertex moves 3 units right and 2 units down.
2. **8 reflection symmetries; 45°** A regular octagon has 8 reflection lines. Divide 360° by 8 to find the smallest turn.

CHALLENGE

5 reflection symmetries; rotational order 5; no nonzero translation symmetry. A nonzero slide moves this finite figure to a different location.

Accept equivalent translation notation, including (x + 3, y - 2). For rotation symmetry, accept "order 5" or "5 rotations in one full turn" for the challenge.