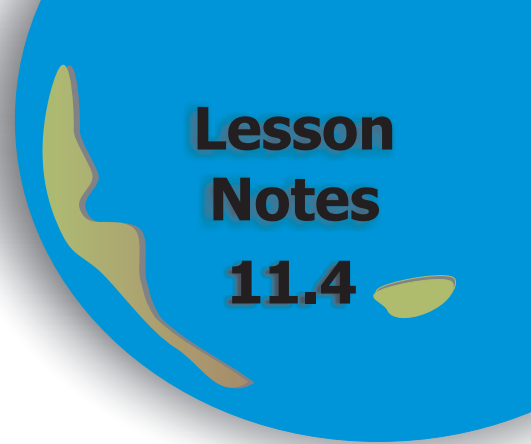


NAME _____

Module 11 Transformation of Shapes

Lesson 4 Symmetry



Lesson Objectives

- Identify lines of symmetry in two-dimensional shapes (e.g. letters of the alphabet, polygons).
- Determine if two shapes have line symmetry, rotation symmetry, and/or point symmetry.

Subtopic 1

Line Symmetry

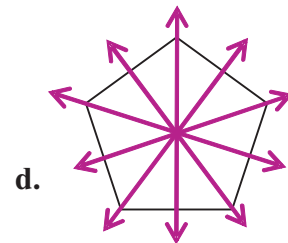
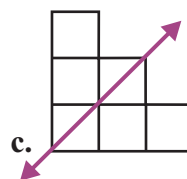
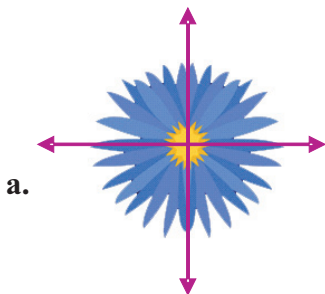
A figure with line symmetry can be divided along a line into congruent mirror images.

This line of division is called the line of symmetry.

- Horizontal
- Vertical
- Diagonal

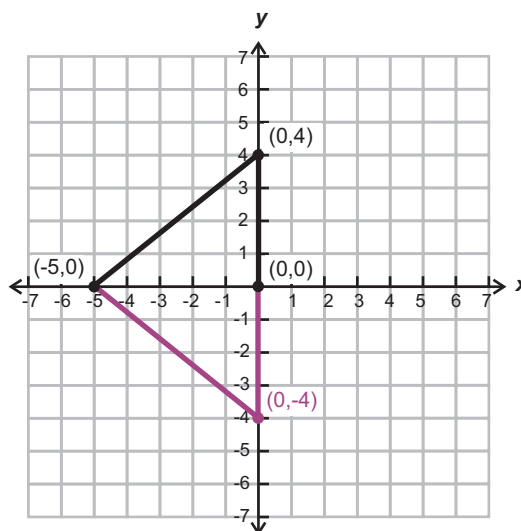
A reflection line is also a line of symmetry.

1 Draw all lines of symmetry on each figure.



2

Complete the figure so it is symmetric to the x -axis.



Subtopic 2 Rotational Symmetry

A figure has rotational symmetry if a rotation of less than 360° about a fixed point reproduces a figure of the same orientation as the original.

This fixed point is called the point of rotation.

The number of times a figure rotates into the same orientation in one full turn is the order of rotation.

Finding angles of rotational symmetry:

- Find the order of rotational symmetry, n .
- Angles of rotational symmetry equal $\frac{360^\circ}{n}$.
- $\frac{360^\circ}{n}, 2\left(\frac{360^\circ}{n}\right), \dots, (n-1)\left(\frac{360^\circ}{n}\right)$

3

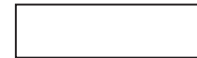
List all the angles of rotational symmetry of the snowflake. Then, name the order of the rotational symmetry.

$60^\circ, 120^\circ, 180^\circ, 240^\circ, 300^\circ$
Order 6



4

List all the angles of rotational symmetry of the rectangle.
Then name the order of the rotational symmetry.



180°: Order 2

Subtopic 3 Point Symmetry

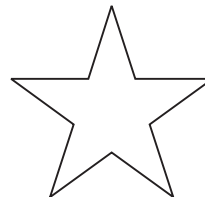
A figure has point symmetry if it has **180°** rotational symmetry.

Point symmetry is a special case of **rotational** symmetry.

- Any figure with **point** symmetry has **rotational** symmetry.
- Not all figures with rotational symmetry have point symmetry.

5

Does the figure have rotational symmetry and point symmetry? Explain the answer.



Rotational symmetry of Order 5: There is no point symmetry.

6

Draw all the lines of symmetry on the regular hexagon. List all the angles of rotational symmetry. Does the figure have point symmetry?

60°, 120°, 180°, 240°, 300°: Yes

