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.

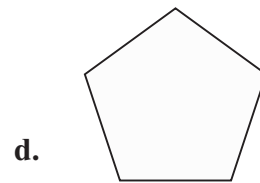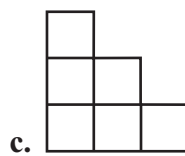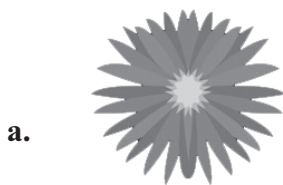**Subtopic 1**   **Line Symmetry**

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

This line of division is called the _____.
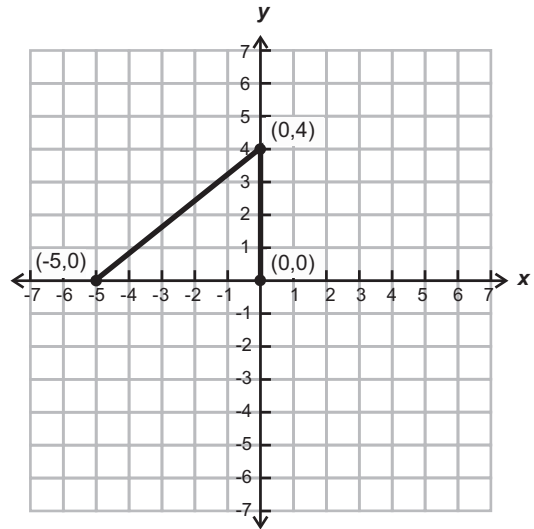
- Horizontal

- Vertical

- _____

A reflection line is also a line of symmetry.

1   Draw all lines of symmetry on each figure.

a.   b. **E**   c.   d.

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

y

(0,4)

(-5,0)   (0,0)

x

Subtopic 2   **Rotational Symmetry**

A figure has rotational symmetry if a rotation of less than _____ about a fixed point

reproduces a figure of the same _____ as the original.

This fixed point is called the _____.

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

_____.

Finding angles of rotational symmetry:

- Find the order of rotational symmetry, *n*.

- Angles of rotational symmetry equal _____.

- $\dfrac{360°}{n}$, $2\left(\dfrac{360°}{n}\right)$, ..., $(n-1)\left(\dfrac{360°}{n}\right)$

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

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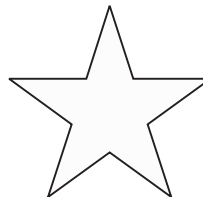

Subtopic 3   **Point Symmetry**

A figure has point symmetry if it has _____ rotational symmetry.

Point symmetry is a special case of _____ symmetry.

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

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

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