

Additional Chapter: Symmetry

Line Symmetry

- Occurs when a figure can be mapped onto itself by a reflection over a line called the **line of symmetry**
- If you fold the figure along the line of symmetry, the two halves coincide
- Figures may have no, one, or more than one line of symmetry

Examples:

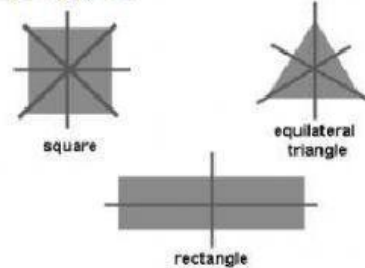
a) In nature



b) Letters of the alphabet



c) Polygons



Examples: How many lines of symmetry, if any, do the figures have?

a)



5

b)

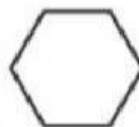


5

c)



d)



e)



Rotational Symmetry

- An object has **rotational symmetry** if there is a center point around which the object is turned (rotated) a certain number of degrees and the object looks the same.
- The order of the symmetry indicates the number of positions in which the object looks the same (order 1 implies no rotational symmetry since it would be a 360° turn).

Examples:

a) Order 4



b) Order 2



c) Order 3



d) Order 1



You Try...Rotational Symmetry

a) Does the shape show rotational symmetry? If so, what are the order of rotation



b) Does the shape show rotational symmetry? If so, what are the order of rotation



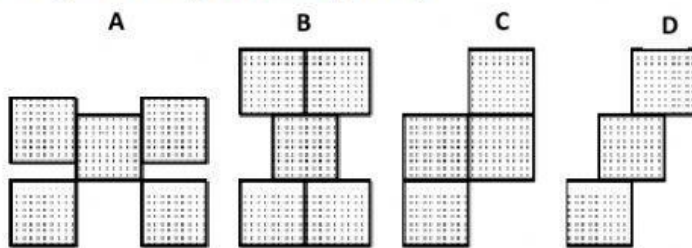
c) Does the hubcap shown have rotational symmetry? If so, what is the order of rotation



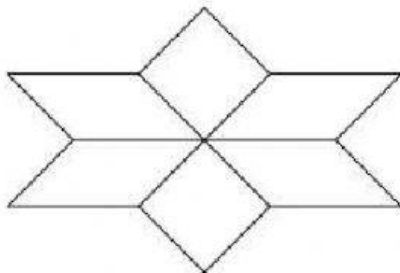
1. Which shapes have at least 2 lines of symmetry?



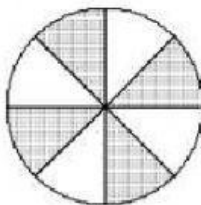
2. Which design has exactly one line of symmetry?



4. How many lines of symmetry does this tessellation have?



9. What is the order of rotational symmetry for this design?



11. Describe the rotational symmetry and line symmetry of this parallelogram.



- Rotational symmetry of order 2 about the centre; no line symmetry
- Rotational symmetry of order 2 about the centre; 1 line of symmetry through the centre
- Rotational symmetry of order 1 about the centre; 1 line of symmetry through the centre
- No rotational symmetry; no line symmetry

21. What is the order of rotational symmetry and number of line symmetry for this design?



Number of Lines of Symmetry =

Order of Rotational Symmetry =