Year 4 · Geometry: Shapes, Sides and Symmetry

Name: _____ Date: _____

Hi there! This sheet helps you name shapes, count their sides and corners, and find lines of symmetry. Take your time and enjoy spotting the patterns!

Warm-up

1. How many sides does a hexagon have?

2. How many corners (vertices) does a triangle have?

3. What is the name of a shape with 5 sides?

4. True or false: a square has 4 sides that are all the same length.

Practice

5. Name each polygon by its number of sides: (a) 4 sides, (b) 8 sides, (c) 10 sides.

6. A polygon has all its sides equal and all its angles equal. Is it a regular polygon or an irregular polygon?

7. Fill in the table for a regular polygon: how many edges and how many vertices does a regular heptagon (7 sides) have?

8. How many lines of symmetry does a square have? How many does a circle have?

9. Word problem: Aroha is making a garden path using tiles shaped like regular pentagons. Each pentagon tile has 5 equal sides of 12 cm. What is the total length around the edge (perimeter) of one tile?

10. Word problem: At Avondale Primary, Mr Tui draws two shapes on the board. Shape A has 6 equal sides and 6 equal angles. Shape B has 6 sides but they are all different lengths. Which shape is regular and which is irregular? Name Shape A.

Challenge

11. A regular octagon has 8 lines of symmetry. A regular hexagon has 6 lines of symmetry. Look at the pattern: how many lines of symmetry does a regular polygon have compared to its number of sides? Use this to find the lines of symmetry in a regular decagon (10 sides).

12. Leilani has a regular polygon tile with a perimeter of 48 cm. Each side is 6 cm long. How many sides does the tile have, and what is the name of this shape? How many lines of symmetry does it have?

Answer key (for parents and tutors)

1. How many sides does a hexagon have?
   A hexagon has 6 sides.
2. How many corners (vertices) does a triangle have?
   A triangle has 3 vertices (corners).
3. What is the name of a shape with 5 sides?
   A shape with 5 sides is called a pentagon.
4. True or false: a square has 4 sides that are all the same length.
   True. A square has 4 equal sides, so it is a regular polygon.
5. Name each polygon by its number of sides: (a) 4 sides, (b) 8 sides, (c) 10 sides.
   (a) 4 sides is a quadrilateral. (b) 8 sides is an octagon. (c) 10 sides is a decagon.
6. A polygon has all its sides equal and all its angles equal. Is it a regular polygon or an irregular polygon?
   It is a regular polygon. Regular polygons have all sides the same length AND all interior angles equal. If either was different, it would be irregular.
7. Fill in the table for a regular polygon: how many edges and how many vertices does a regular heptagon (7 sides) have?
   A heptagon has 7 edges and 7 vertices. A polygon always has the same number of edges as vertices.
8. How many lines of symmetry does a square have? How many does a circle have?
   A square has 4 lines of symmetry (two through the middle of opposite sides, and two along the diagonals). A circle has an infinite number of lines of symmetry, because you can draw a line through its centre in any direction.
9. Word problem: Aroha is making a garden path using tiles shaped like regular pentagons. Each pentagon tile has 5 equal sides of 12 cm. What is the total length around the edge (perimeter) of one tile?
   A regular pentagon has 5 equal sides, each 12 cm. Perimeter = 5 × 12 cm = 60 cm. So one tile measures 60 cm all the way around.
10. Word problem: At Avondale Primary, Mr Tui draws two shapes on the board. Shape A has 6 equal sides and 6 equal angles. Shape B has 6 sides but they are all different lengths. Which shape is regular and which is irregular? Name Shape A.
    Shape A is regular because all 6 sides and all 6 angles are equal, it is a regular hexagon. Shape B is irregular because its sides are different lengths, so it is an irregular hexagon.
11. A regular octagon has 8 lines of symmetry. A regular hexagon has 6 lines of symmetry. Look at the pattern: how many lines of symmetry does a regular polygon have compared to its number of sides? Use this to find the lines of symmetry in a regular decagon (10 sides).
    For a regular polygon, the number of lines of symmetry equals the number of sides. An octagon (8 sides) has 8, a hexagon (6 sides) has 6. So a regular decagon (10 sides) has 10 lines of symmetry.
12. Leilani has a regular polygon tile with a perimeter of 48 cm. Each side is 6 cm long. How many sides does the tile have, and what is the name of this shape? How many lines of symmetry does it have?
    Number of sides = perimeter ÷ side length = 48 cm ÷ 6 cm = 8 sides. A shape with 8 equal sides is a regular octagon. Because it is a regular polygon, it has 8 lines of symmetry (one for each side).