Year 6 · Geometry: Sorting Shapes & Turns

Name: _____ Date: _____

Kia ora! This sheet helps you classify quadrilaterals, work with angles inside triangles and four-sided shapes, and figure out how many times a shape looks the same as it spins around. Take your time and enjoy!

Warm-up

1. Name the quadrilateral that has four right angles and four equal-length sides.

2. How many sides does a trapezium have, and how many pairs of parallel sides?

3. What do the three interior angles of any triangle add up to?

4. What is the order of rotational symmetry of a circle?

Practice

5. A parallelogram has two pairs of parallel sides. Explain how a rectangle is a special kind of parallelogram.

6. A kite has two pairs of equal-length adjacent sides. Is a rhombus a kite? Explain.

7. A triangle has two angles of 65° and 40°. What is the size of the third angle?

8. State the order of rotational symmetry of: (a) a square, (b) a rectangle (not a square), (c) an equilateral triangle.

9. Aroha is making a kite for the Manukau kite day. Three of its interior angles are 100°, 75° and 100°. What is the size of the fourth angle?

10. Tama sorts shapes for a display at school. He has a shape with four sides where every side is the same length but it has no right angles. What quadrilateral is it, and why is it not a square?

Challenge

11. A quadrilateral has interior angles in the ratio 1 : 2 : 3 : 3. Work out all four angles, then say whether the shape could be a trapezium.

12. Compare a triangular prism and a square-based pyramid. State how many faces, edges and vertices each has, and describe one key difference in their faces.

Answer key (for parents and tutors)

1. Name the quadrilateral that has four right angles and four equal-length sides.
   A square. It has four right angles (like a rectangle) and four equal sides (like a rhombus), so it fits both descriptions.
2. How many sides does a trapezium have, and how many pairs of parallel sides?
   A trapezium has 4 sides and exactly 1 pair of parallel sides.
3. What do the three interior angles of any triangle add up to?
   They add up to 180°.
4. What is the order of rotational symmetry of a circle?
   Infinite. A circle looks exactly the same no matter how far you turn it.
5. A parallelogram has two pairs of parallel sides. Explain how a rectangle is a special kind of parallelogram.
   A rectangle has two pairs of parallel sides, so it is a parallelogram. It is 'special' because it also has four right angles, which not every parallelogram has.
6. A kite has two pairs of equal-length adjacent sides. Is a rhombus a kite? Explain.
   Yes. A rhombus has four equal sides, so its adjacent (next-to-each-other) sides are equal in two pairs. That fits the kite rule, so a rhombus can be classed as a special kite.
7. A triangle has two angles of 65° and 40°. What is the size of the third angle?
   The three angles add to 180°. 65° + 40° = 105°. Third angle = 180° − 105° = 75°.
8. State the order of rotational symmetry of: (a) a square, (b) a rectangle (not a square), (c) an equilateral triangle.
   (a) A square has order 4, it matches its original position 4 times in a full turn. (b) A rectangle has order 2. (c) An equilateral triangle has order 3.
9. Aroha is making a kite for the Manukau kite day. Three of its interior angles are 100°, 75° and 100°. What is the size of the fourth angle?
   The four interior angles of any quadrilateral add up to 360°. 100° + 75° + 100° = 275°. Fourth angle = 360° − 275° = 85°.
10. Tama sorts shapes for a display at school. He has a shape with four sides where every side is the same length but it has no right angles. What quadrilateral is it, and why is it not a square?
    It is a rhombus. A rhombus has four equal-length sides. It is not a square because a square must also have four right angles, and this shape has none.
11. A quadrilateral has interior angles in the ratio 1 : 2 : 3 : 3. Work out all four angles, then say whether the shape could be a trapezium.
    The parts add to 1 + 2 + 3 + 3 = 9 parts. The four angles total 360°, so one part = 360° ÷ 9 = 40°. The angles are 40°, 80°, 120° and 120°. This could be a trapezium: a pair of equal angles (120° and 120°) sitting next to the other angles can occur when one pair of sides is parallel, so a trapezium is possible.
12. Compare a triangular prism and a square-based pyramid. State how many faces, edges and vertices each has, and describe one key difference in their faces.
    Triangular prism: 5 faces (2 triangles + 3 rectangles), 9 edges, 6 vertices. Square-based pyramid: 5 faces (1 square + 4 triangles), 8 edges, 5 vertices. Key difference: a prism has two identical parallel end faces joined by rectangles, while a pyramid has one base and triangular faces that all meet at a single apex point.