

GRADE 8 | 2024

Geometry: Lines, Angles & Shapes

Mathematics

CAPS ALIGNED

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1. Types of Angles

- Acute angle: less than 90 degrees
- Right angle: exactly 90 degrees
- Obtuse angle: between 90 and 180 degrees
- Straight angle: exactly 180 degrees
- Reflex angle: between 180 and 360 degrees
- Revolution: exactly 360 degrees

2. Angle Relationships

Complementary and Supplementary

FORMULA: Complementary angles: add up to 90 degrees

Supplementary angles: add up to 180 degrees

Vertically Opposite Angles

KEY POINT: Vertically opposite angles are EQUAL. They are formed when two lines cross.

Parallel Lines Cut by a Transversal

- Co-interior angles: add up to 180 degrees (same side of transversal)
- Alternate angles: are equal (Z-angles)
- Corresponding angles: are equal (F-angles)

3. Triangles

A triangle has 3 sides and 3 angles. The sum of angles in any triangle = 180 degrees.

- Equilateral triangle: all 3 sides equal, all 3 angles = 60 degrees
- Isosceles triangle: 2 sides equal, 2 base angles equal
- Scalene triangle: no sides equal, no angles equal
- Right-angled triangle: one angle = 90 degrees

4. Quadrilaterals

A quadrilateral has 4 sides. The sum of angles = 360 degrees.

- Square: all sides equal, all angles 90 degrees
- Rectangle: opposite sides equal, all angles 90 degrees
- Parallelogram: opposite sides equal and parallel
- Rhombus: all sides equal, opposite angles equal
- Trapezium: one pair of parallel sides

5. Pythagoras Theorem

FORMULA: In a right-angled triangle: $a^2 + b^2 = c^2$

where c is the hypotenuse (side opposite the right angle)

EXAMPLE: Find the hypotenuse

$$a = 3, b = 4$$

$$c^2 = 3^2 + 4^2 = 9 + 16 = 25$$

$$c = 5$$