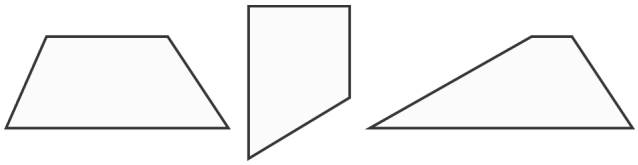
Properties of quadrilaterals: Information sheets

http://topdrawer.aamt.edu.au/Geometric-reasoning/Big-ideas/Plane-shapes/Polygons

Trapeziums

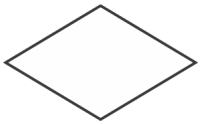
A **trapezium** is a quadrilateral with at least one pair of sides parallel.

Here are some examples of trapeziums:



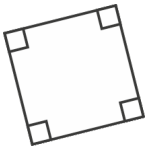
All trapeziums possess the following property: One pair of sides of a trapezium is parallel.

This trapezium is usually called a rhombus:



This trapezium is usually called a parallelogram:

This trapezium is usually called a square:



This trapezium is usually called a rectangle:

Challenge 1: Draw a trapezium with exactly 1 pair of parallel sides and exactly 2 equal sides.

Challenge 2: Draw a trapezium with exactly 1 pair of parallel sides and exactly 3 equal sides.

Challenge 3: Draw a trapezium with exactly 4 equal sides.

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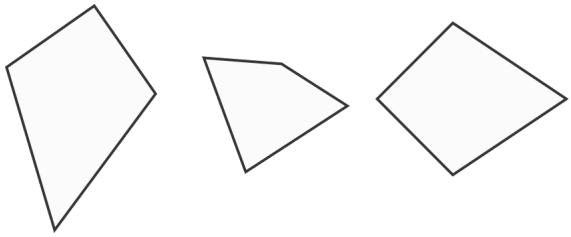
Kites

A **kite** is a quadrilateral with two pairs of adjacent sides equal.

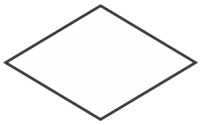
Here are some examples of kites:



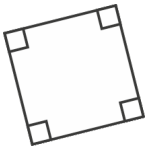
All kites possess the following properties:

- Two pairs of adjacent sides of a kite are equal
- One diagonal of a kite bisects the other diagonal
- One diagonal of a kite bisects the opposite angles
- The diagonals of a kite are perpendicular
- A kite has at least one axis of symmetry

This kite is usually called a rhombus:



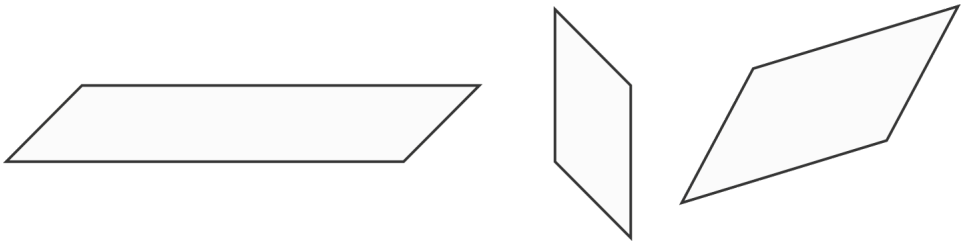
This kite is usually called a square:



Parallelograms

A **parallelogram** is a quadrilateral whose opposite sides are parallel.

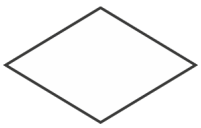
Here are some examples of parallelograms:



All parallelograms possess the following properties:

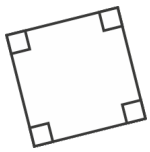
- The opposite sides of a parallelogram are parallel
- The opposite sides of a parallelogram are equal
- The opposite angles of a parallelogram are equal
- The diagonals of a parallelogram bisect each other
- A parallelogram has point symmetry and rotational symmetry

This parallelogram is usually called a rhombus:

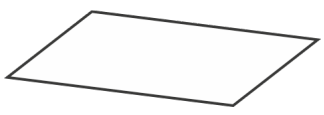


This parallelogram is usually called a rectangle:

This parallelogram is usually called a square:



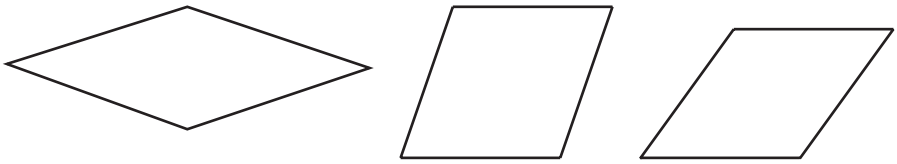
I am a quadrilateral. I am also a trapezium. My best name is a parallelogram:



Rhombuses

A **rhombus** is a quadrilateral with all sides equal.

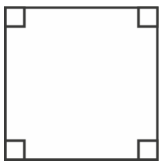
Here are some examples of rhombuses:



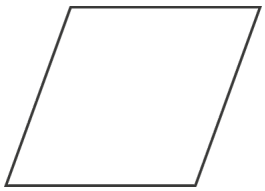
All rhombuses possess the following properties:

- The opposite sides of a rhombus are parallel
- All sides of a rhombus are equal
- The opposite angles of a rhombus are equal
- The diagonals of a rhombus bisect the opposite angles
- The diagonals of a rhombus bisect each other
- The diagonals of a rhombus are perpendicular
- A rhombus has two axes of symmetry
- A rhombus has point symmetry and rotational symmetry

This rhombus is usually called a square:



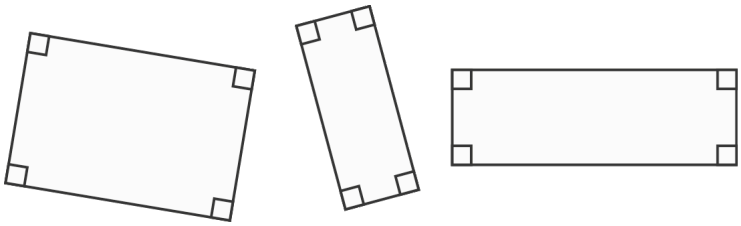
I am a quadrilateral. I am also a kite, a trapezium and a parallelogram. My best name is a rhombus:



Rectangles

A **rectangle** is a quadrilateral in which all angles are right angles.

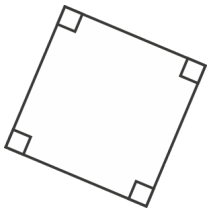
Here are some examples of rectangles:



All rectangles possess the following properties:

- The opposite sides of a rectangle are parallel
- The opposite sides of a rectangle are equal
- All angles at the vertices of a rectangle are 90^{o}
- The diagonals of a rectangle are equal
- The diagonals of a rectangle bisect each other
- A rectangle has two axes of symmetry
- A rectangle has point symmetry and rotational symmetry

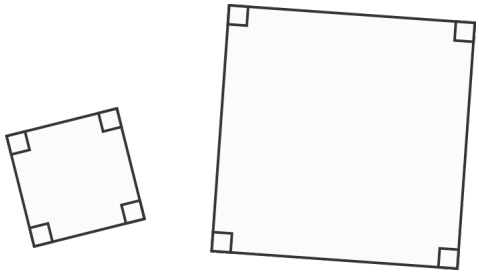
This rectangle is usually called a square:



I am a quadrilateral. I am also a trapezium and a parallelogram. My best name is a rectangle:

Squares

A **square** is a quadrilateral that is both a rectangle and a rhombus.
Here are some examples of squares:



All squares possess the following properties:

- Opposite sides of a square are parallel
- All sides of a square are equal
- All angles at the vertices of a square are 90^{o}
- The diagonals of a square are equal
- The diagonals of a square bisect the opposite angles
- The diagonals of a square bisect each other
- The diagonals of a square are perpendicular
- A square has four axes of symmetry
- A square has point symmetry and rotational symmetry

I am a quadrilateral. I am also a kite, a trapezium, a rhombus, a parallelogram and a rectangle. My best name is a square.