

# Types of Quadrilaterals



# Aim

- To identify and discuss different types of quadrilaterals.

# Success Criteria

- To name different quadrilaterals.
- To describe the properties of different types of quadrilaterals.
- To work out the value of a missing angle inside a quadrilateral.

# Vocabulary Check

Match each word to its meaning.

Perpendicular

Equal

Bisect

Adjacent

Right-angle

Parallel

Interior angle

Diagonal

next to

lines that have the same distance between them and will never meet

a line or plane at an angle of  $90^\circ$  to another line or plane

the same as

a straight line joining two opposite corners of a straight-sided shape, such as a square or rectangle

divide something into two equal parts

an angle of  $90^\circ$

an angle inside a shape

# What Is a Quadrilateral?

a 2D shape

a 4-sided  
shape

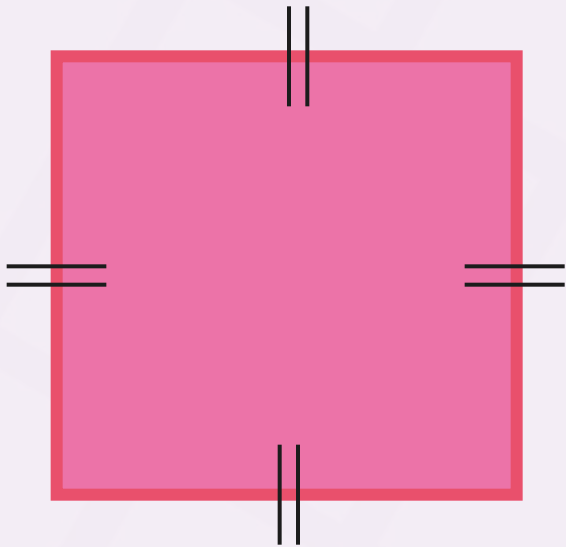


all of its sides  
are straight

has 4 interior  
angles that  
add up to  $360^\circ$

# Square

Do you know what the properties of a square are?



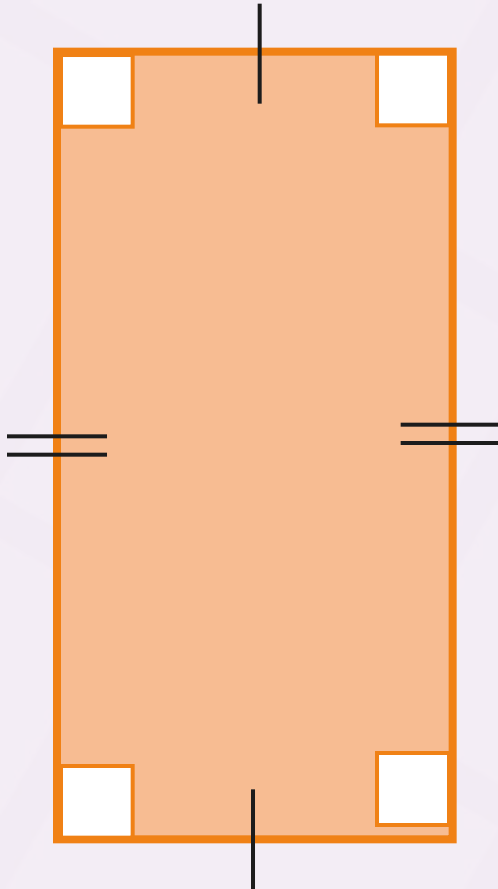
- All sides are of equal length.
- Opposite sides are parallel.
- All interior angles are equal.

If the interior angles of a quadrilateral add up to  $360^\circ$ , what must each interior angle of a square be?

**Each angle is a right angle of  $90^\circ$ .**

# Rectangle

Do you know what the properties of a rectangle are?

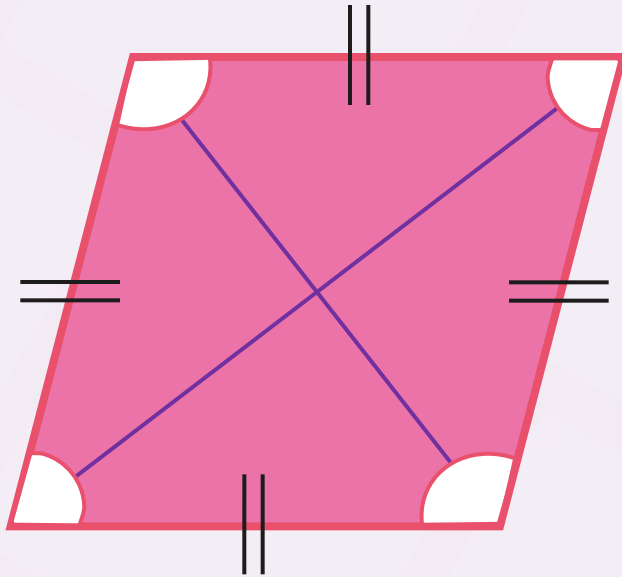


- Opposite sides are parallel and of equal length.
- Every angle is a right angle ( $90^\circ$ ).

Squares can be classified as rectangles, but not all rectangles can be classified as squares. Can you explain why?

**A rectangle has opposite sides of equal length and has four  $90^\circ$  angles. A square has opposite sides of equal length and four  $90^\circ$  angles. However, in a square, all of the sides are of equal length.**

# Rhombus



Do you know what the properties of a rhombus are?

- All 4 sides are of equal length.
- Diagonally opposite angles are equal.
- 2 angles are acute and 2 are obtuse.
- Opposite sides are parallel.
- Diagonals bisect each other at right angles.

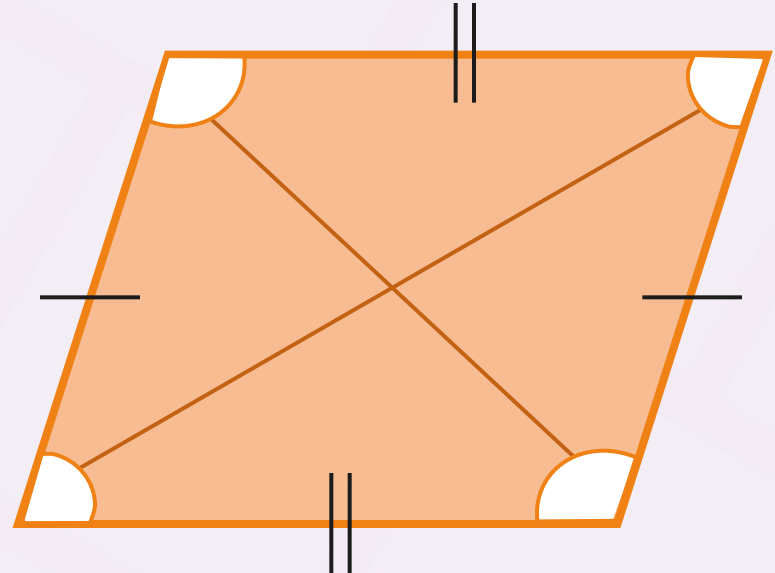
What other name could be given to a rhombus?

**A parallelogram.**

# Parallelogram

Do you know what the properties of a parallelogram are?

- It has 2 pairs of equal parallel sides.
- Diagonally opposite angles are equal.
- 2 angles are acute and 2 are obtuse.



A rhombus is a type of parallelogram. Which property means that not all parallelograms are rhombuses?

**In a rhombus, all of the sides are equal.**



# Trapezium

Do you know what the properties of a trapezium are?

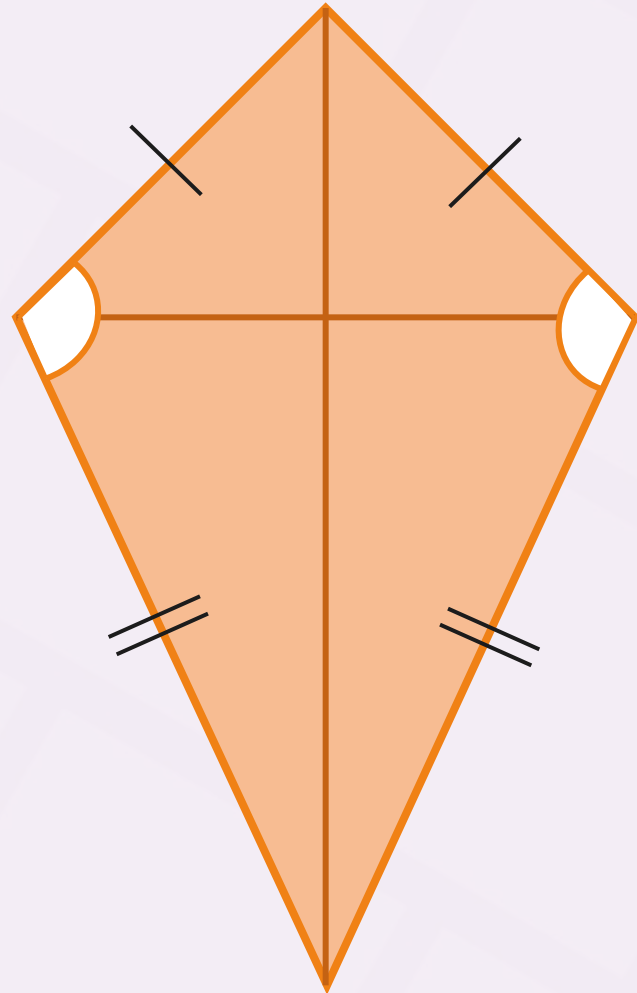


- Has 1 pair of parallel sides.

# Kite

Do you know what the properties of a kite are?

- Has 2 pairs of equal, adjacent sides.
- Diagonals bisect each other at right angles.
- 1 pair of opposite angle are equal.



# What Am I?

I have 4 right angles but my sides are not all equal. What am I?  
angles. what am I?

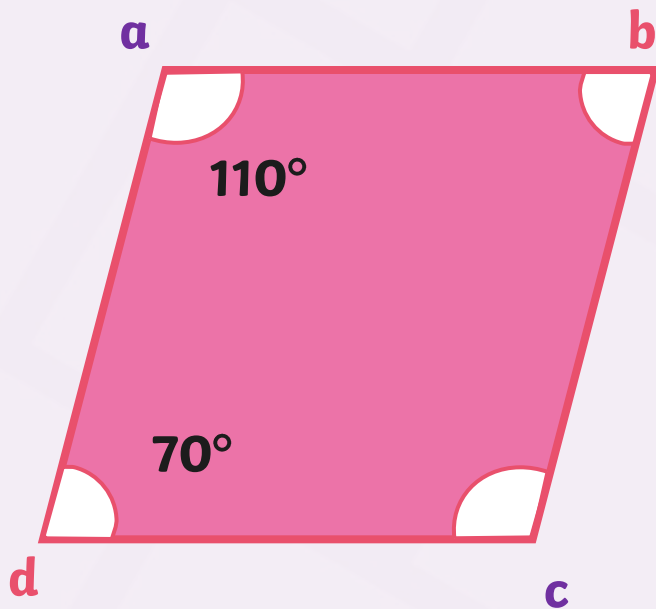
**I am a rectangle.**

**I am a kite.**



# Find the Missing Angle

How can we find the missing angles in this parallelogram?



What do we know that can help us?

- The angles in a quadrilateral add up to  $360^\circ$ .
- Opposite angles in a parallelogram are equal.

$$a = 110^\circ \text{ so } c = 110^\circ$$

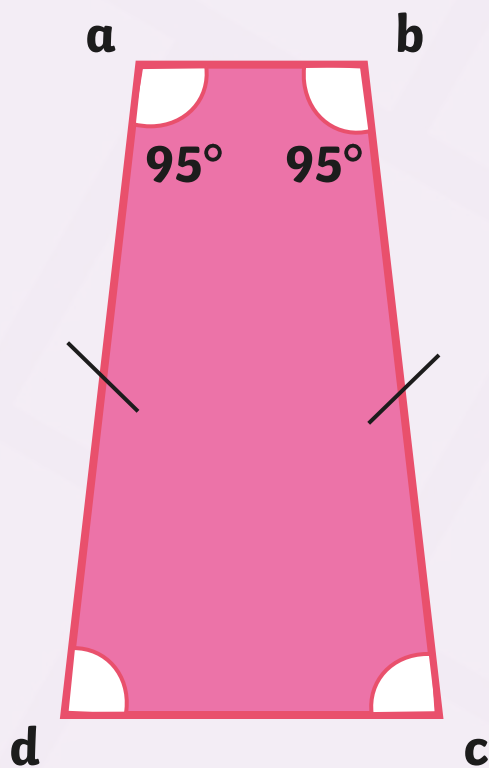
$$d = 70^\circ \text{ so } b = 70^\circ$$

Check your answer by adding all of the angles together again.

$$110^\circ + 110^\circ + 70^\circ + 70^\circ = 360^\circ$$

# Find the Missing Angle

How can we find the missing angles in this regular trapezium?



What do we know that can help us?

- All 4 angles will add up to  $360^\circ$ .
- The 2 lines show that the sides are equal so angles d and c must also be equal.

Add together the angles that you know.

$$95^\circ + 95^\circ = 190^\circ$$

Take this away from  $360^\circ$  to find what's left.

$$360^\circ - 190^\circ = 170^\circ$$

As c and d are equal, divide  $170^\circ$  by 2:

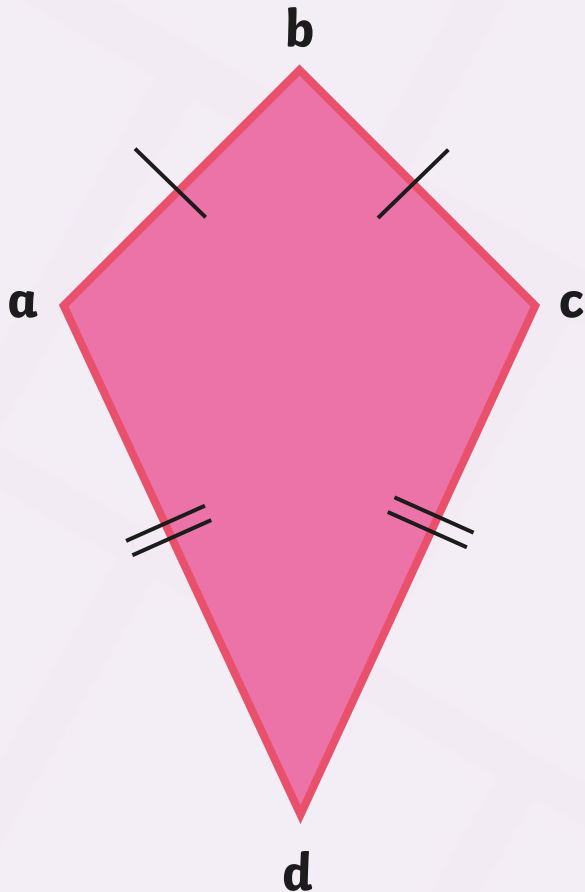
$$170^\circ \div 2 = 85^\circ$$

Check your answer by adding all of the angles together again.

$$95^\circ + 95^\circ + 85^\circ + 85^\circ = 360^\circ$$

# Find the Missing Angle

If angle A is  $120^\circ$  and D is  $40^\circ$ , what are angles B and C?  
How do you know?



What do we know that can help us?

- The angles in any quadrilateral add up to  $360^\circ$ .
- 1 pair of angles is equal.

A and C are equal, so  $C = 120^\circ$

$$120^\circ + 40^\circ + 120^\circ = 280^\circ$$

$$360^\circ - 280^\circ = 80^\circ$$

$$B = 80^\circ$$

