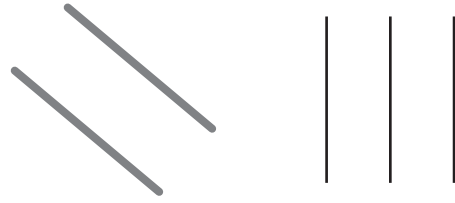


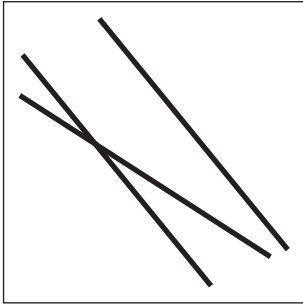
Lines, angles and shapes – parallel and perpendicular lines

Parallel lines are always the same distance away from each other at any point and can never meet. They can be any length and go in any direction.

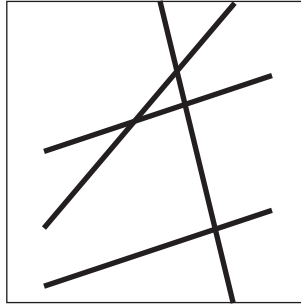


1 Look at each group of lines. Trace over any parallel lines with a coloured pencil:

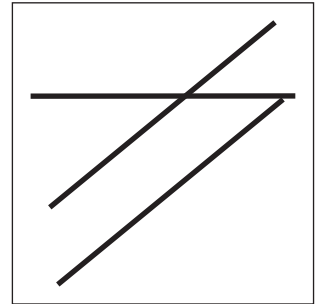
a



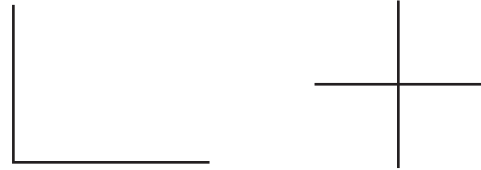
b



c

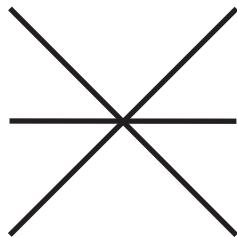


Perpendicular lines meet at right angles. Sometimes they intersect (cross over), sometimes they do not intersect.

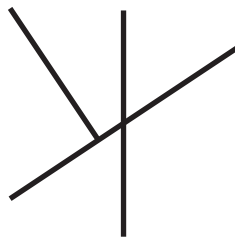


2 Trace each pair of perpendicular lines with a coloured pencil:

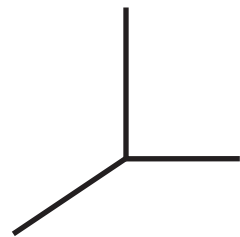
a



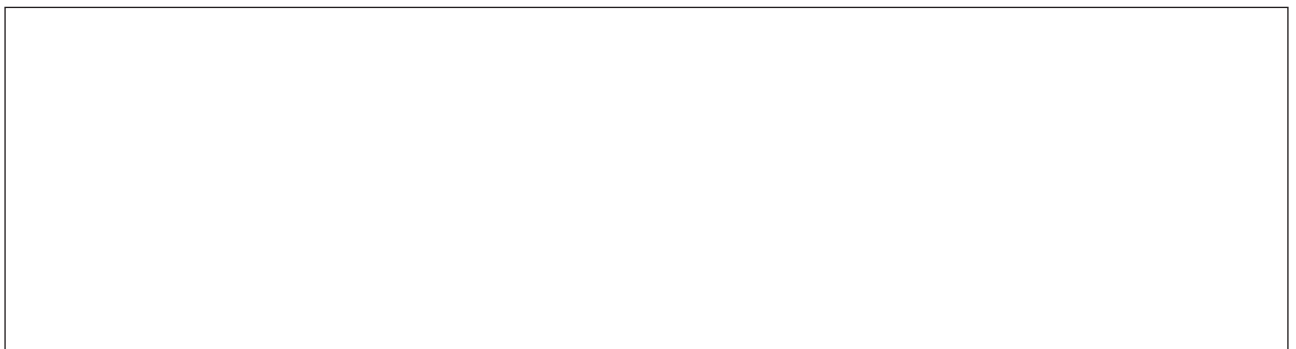
b



c



3 In this space, draw three pairs of parallel lines and three pairs of perpendicular lines:

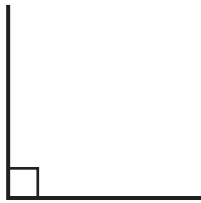


Lines, angles and shapes – angles

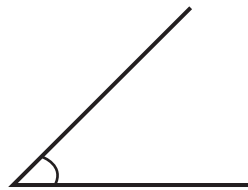
An angle is the amount of turning between two lines that meet.

There are three classifications of angles depending on their size.

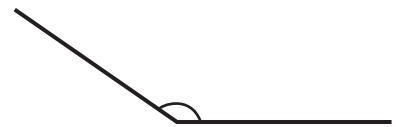
A right angle is 90° (degrees).



An acute angle is smaller than a right angle.

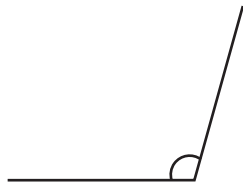


An obtuse angle is larger than a right angle.

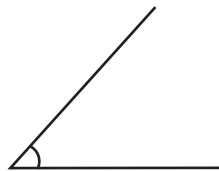


1 Classify each angle as right, acute or obtuse.

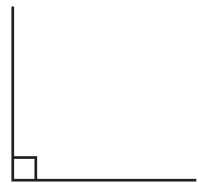
a



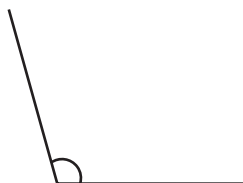
b



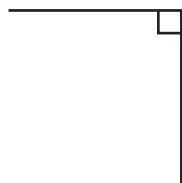
c



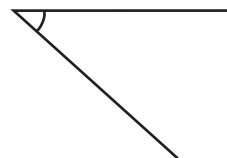
d



e

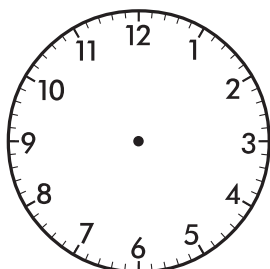


f

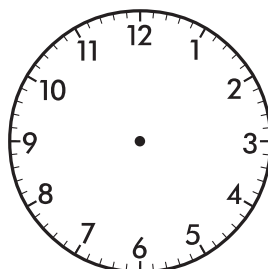


2 Draw hands on each clock that show a time for each type of angle.

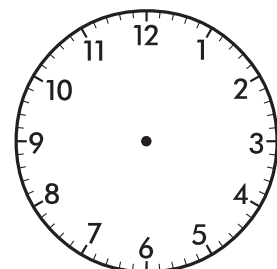
a Right angle



b Obtuse angle



c Acute angle



Lines, angles and shapes – angles

3 Use your ruler to draw three more examples of each type of angle.

a Right angles



b Acute angles



c Obtuse angles

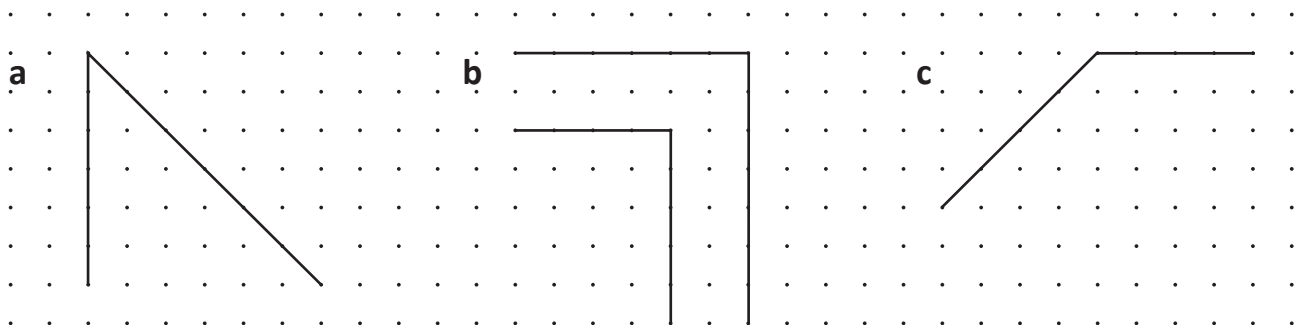


4 Complete each closed shape according to the directions:

Shape **a** has 2 acute angles.

Shape **b** has 5 right angles.

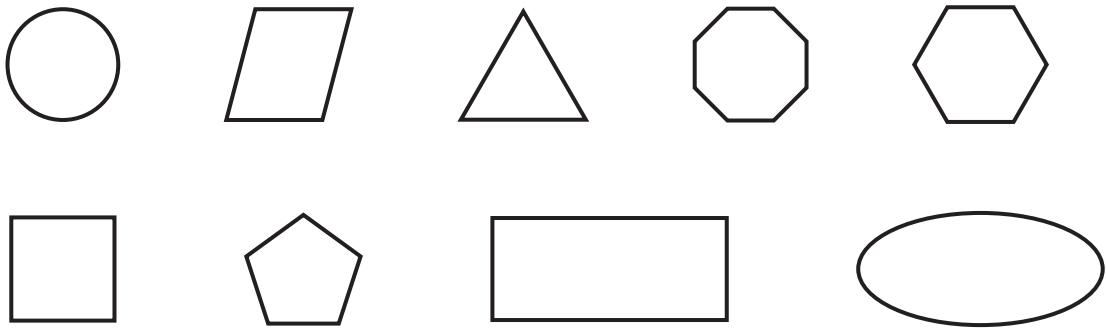
Shape **c** has 2 acute and 2 obtuse angles.



Lines, angles and shapes – polygons and quadrilaterals 1

Polygons are shapes with 3 or more sides.
Quadrilaterals are shapes with 4 sides.

1 Tick the polygons. Circle the quadrilaterals.



2 Complete this table:

	Name	Number of sides	Number of angles
a	rhombus		
b	pentagon		
c	trapezium		
d	octagon		
e	hexagon		
f	square		
g	rectangle		
h	triangle		

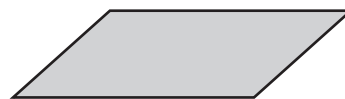
3 Name one shape that is both a quadrilateral and a polygon:

4 Why is a circle not a polygon?

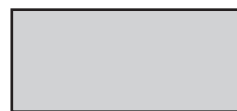
Lines, angles and shapes – types of quadrilaterals

A parallelogram is a quadrilateral with 2 pairs of parallel sides.

This is a parallelogram. Its opposite sides are an equal length and are parallel to each other.



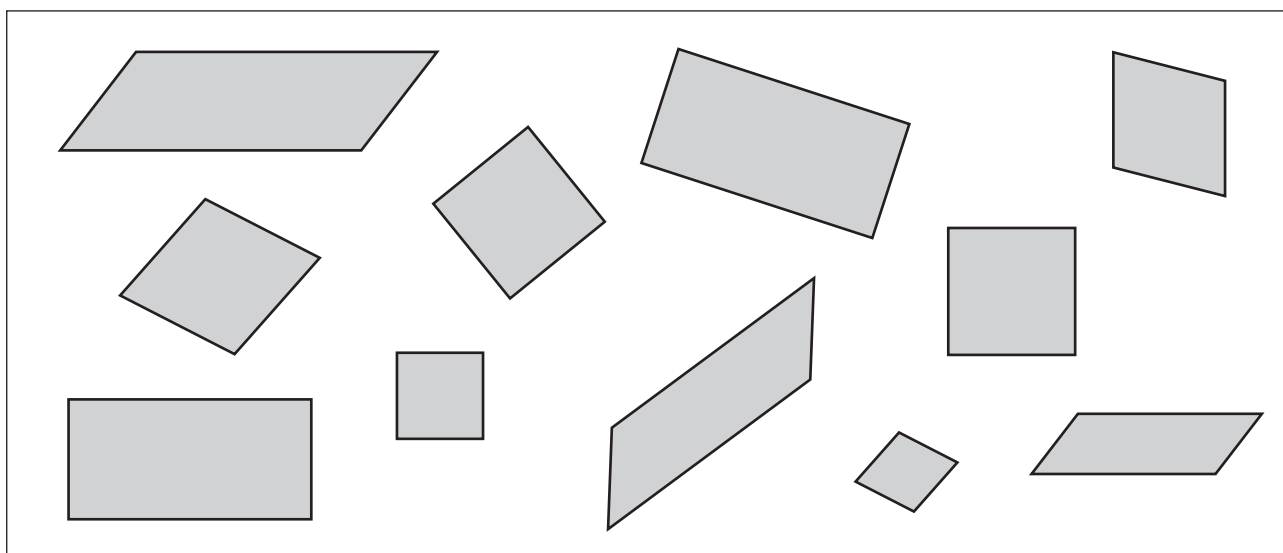
A square and a rectangle are also parallelograms. They have opposite sides that are equal lengths and are parallel to each other.



A rhombus is a parallelogram. Its opposite sides are an equal length and are parallel to each other. It has 4 equal sides.



- 1** How many pairs of parallel lines are there in these parallelograms?
Count them:

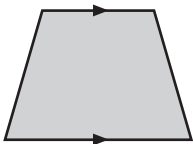


- 2** Write the number of shapes you can see in the box above.

	Name	Number of shapes
a	rhombuses	
b	squares	
c	rectangles	
d	parallelograms	
e	quadrilaterals	

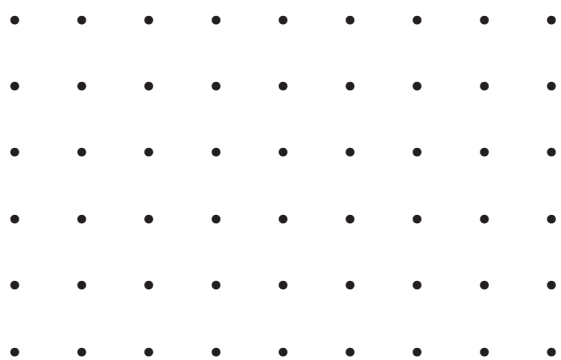
Lines, angles and shapes – types of quadrilaterals

A trapezium is a quadrilateral and has one pair of parallel sides.



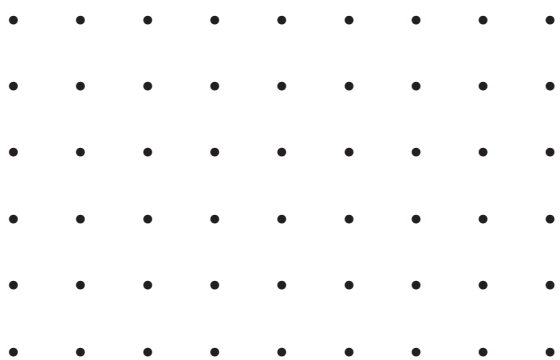
3 Check your understanding of types of parallelograms and trapeziums.

a Draw a shape with two pairs of parallel sides and sides that are equal in length.



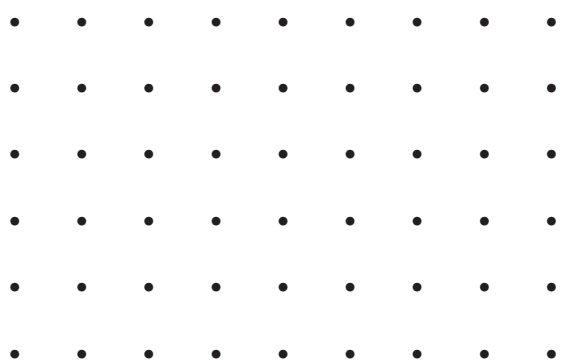
This shape is a _____.

b Draw a shape with one pair of parallel sides.



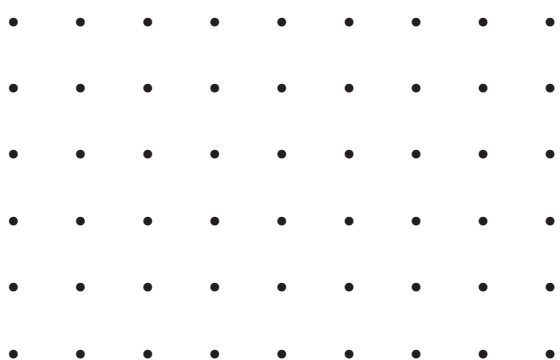
This shape is a _____.

c Draw a shape with two pairs of parallel sides and opposite sides that are equal.



This shape is a _____.

d Draw another parallelogram that is different to the others.



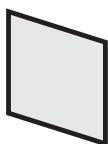
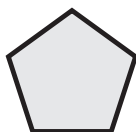
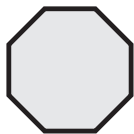
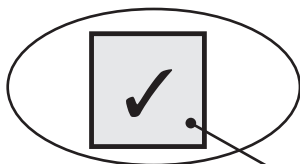
This shape is a _____.

Lines, angles and shapes – polygons and quadrilaterals 2

- 1 Decide whether each shape in the table is a quadrilateral or a polygon or both. Write yes or no.

	Name	Quadrilateral	Polygon
a	square		
b	rectangle		
c	hexagon		
d	octagon		
e	pentagon		
f	triangle		

- 2 Draw lines to connect the shapes to the labels. Then put a tick in the shapes which are quadrilaterals and circle the parallelograms. The first one has been done for you.



rhombus

square

rectangle

pentagon

hexagon

trapezium

octagon

Some labels might have more than one connecting line.



4 sides

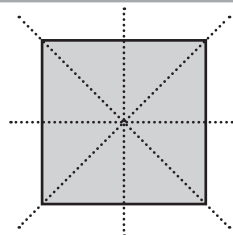
5 sides

6 sides

8 sides

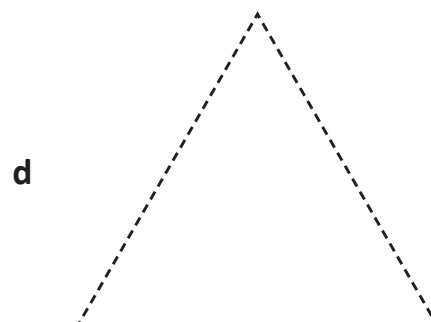
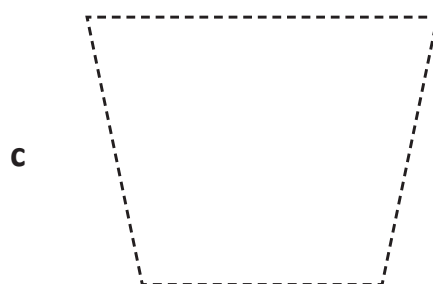
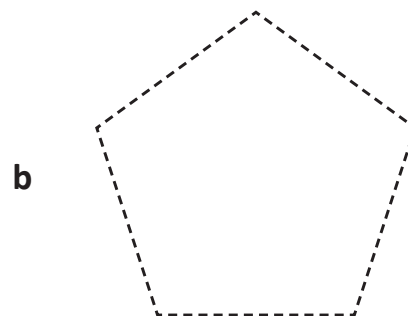
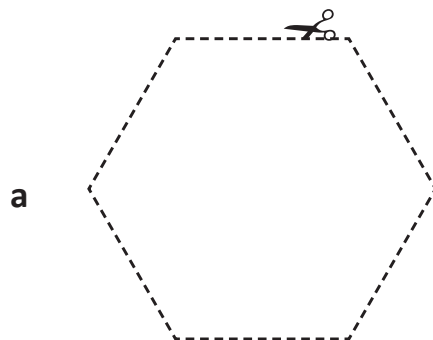
Lines, angles and shapes – symmetry

A shape is symmetrical when you can fold it in half so that one half exactly covers the other half. The fold line is the axis of symmetry. Many 2D shapes have more than one line of symmetry.

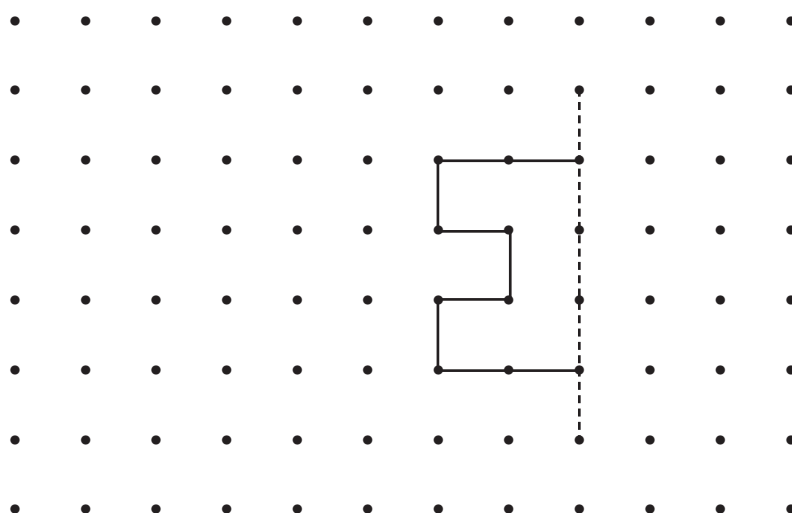
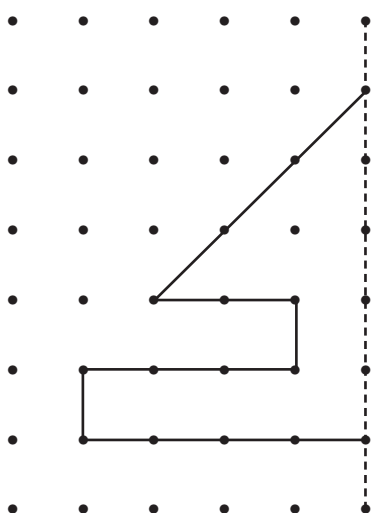


This shape has 4 lines of symmetry.

- 1** Copy this page and cut out each shape. Find all the lines of symmetry. See how many different ways you can fold each shape in half. Then draw in all the lines of symmetry on the shapes on this page.



- 2** Use the line of symmetry and a ruler to complete each shape.





Getting
ready

For these challenges, you will need a ruler and a pencil.



What
to do

Here are four unfinished symmetrical designs on dot paper.

You must complete them. For each design, you must use a horizontal line, a vertical line and two diagonal lines.

When they are finished, they will each be symmetrical.

For each design, decide where the line of symmetry will be.

Pretend the line is a mirror – what will the reflection look like?

