

# YEAR 8 - DEVELOPING GEOMETRY...

## Line symmetry and reflection

@whisto\_maths

### What do I need to be able to do?

By the end of this unit you should be able to:

- Recognise line symmetry
- Reflect in a horizontal line
- Reflect in a vertical line
- Reflect in a diagonal line

### Keywords

**Mirror line:** a line that passes through the center of a shape with a mirror image on either side of the line

**Line of symmetry:** same definition as the mirror line

**Reflect:** mapping of one object from one position to another of equal distance from a given line.

**Vertex:** a point where two or more-line segments meet.

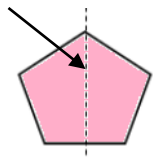
**Perpendicular:** lines that cross at  $90^\circ$

**Horizontal:** a straight line from left to right (parallel to the x axis)

**Vertical:** a straight line from top to bottom (parallel to the y axis)

### Lines of symmetry

Mirror line (line of reflection)



Shapes can have more than one line of symmetry...  
This regular polygon (a regular pentagon has 5 lines of symmetry)



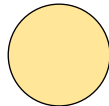
Rhombus  
two lines of symmetry

Parallelogram

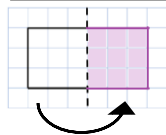
No lines of symmetry



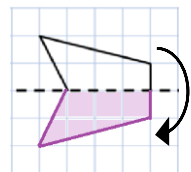
A circle has an infinite amount of lines of symmetry



### Reflect horizontally/ vertically (1)



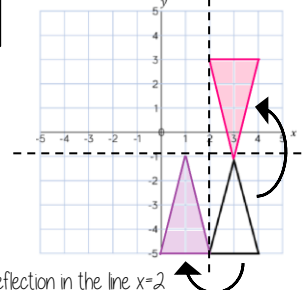
Reflection in a vertical line



Reflection in a horizontal line

Note a reflection doubles the area of the original shape

Reflection on an axis grid

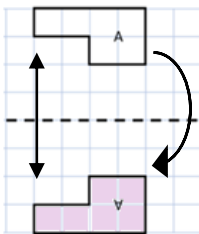


Reflection in the line  $y=-2$

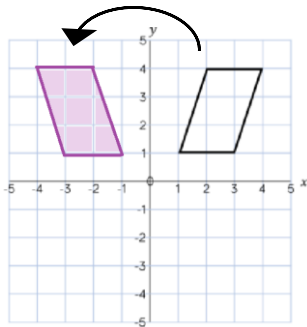
Reflection in the line  $x=2$

### Reflect horizontally/ vertically (2)

All points need to be the same distance away from the line of reflection



Reflection in the line  $y$  axis — this is also a reflection in the line  $x=0$



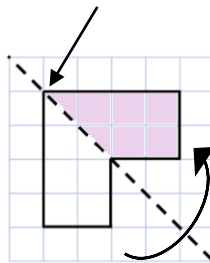
Lines parallel to the  $x$  and  $y$  axis

REMEMBER

Lines parallel to the  $x$ -axis are  $y = \dots$   
Lines parallel to the  $y$ -axis are  $x = \dots$

### Reflect Diagonally (1)

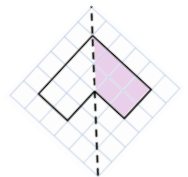
Points on the mirror line don't change position



Fold along the line of symmetry to check the direction of the reflection

Turn your image

If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)

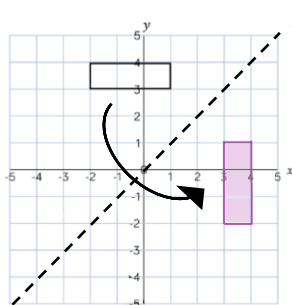


Drawing perpendicular lines

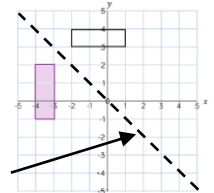
Perpendicular lines to and from the mirror line can help you to plot diagonal reflections

### Reflect Diagonally (2)

This is the line  $y = x$  (every  $y$  coordinate is the same as the  $x$  coordinate along this line)



This is the line  $y = -x$   
The  $x$  and  $y$  coordinate have the same value but opposite sign



Turn your image

If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)

