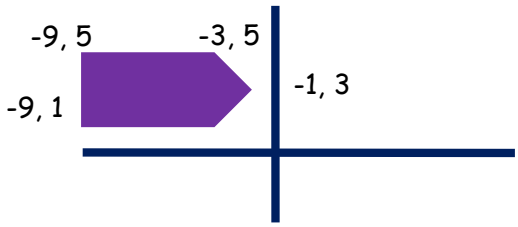
**Coordinates Prior Assessment Question 6**

**Objective:** I can reflect shapes in the axis and mirror lines.

SH7: draw and translate simple shapes on the coordinate plane, and reflect them in the axis.

**Teacher Input Ideas:**

Recap with the children how to find missing coordinates from images of shapes and their coordinates. Show the children the image below and allow the children time to work out the missing coordinate and explain how they got the answer.




Other shapes and missing coordinates could be presented that require the children to further use their knowledge of the properties of shape to work out the missing coordinate (such as a parallelogram).

Ask the children to plot this shape onto a 4-quadrant grid using the coordinates they have been given and the one that they have worked out. Now introduce to the children to the word reflect. Discuss the meaning of the word. Inform the children that often on a coordinate grid the image is reflected on the y or x axis. Encourage children to discuss and model the meaning of this. Provide the children with some examples of how to reflect images in the y and x axis.

With the children, model reflecting a shape in the y axis. Pick out with the children how a mirror can be used or you can draw a line to imagine the mirror. Some children may benefit from having mirrors to reflect the shape that they have drawn in to another quadrant by reflecting it in the y axis. Discuss key points with the children such as how the image is reflected and not moved, therefore the image is reversed. Also discuss identifying vertices and the coordinates. How far are they away from the mirror line? This should be the same in the other quadrant. Remind the children how we translated a vertex at a time and this is a good strategy to do when reflecting. Model using the squares on the gird to check distance from the y axis and to check the size of the shape is accurate. Some children find it hard to reflect shapes in a mirror and to plot these so larger mirrors and sheets of paper can help alongside small adult led groups.

## Practice Activities

**Purple Practice: most suited for children who made errors in Question 6 of the prior learning assessment and require more support with using a mirror to reflect a shape.**

Practical activity: provide the children with 2 or 4 peg boards to make 2 or 4 quadrant grids. Encourage the children to create a y and x axis with coloured wool or sting. Children to then make a shape in one of the quadrants by using pegs for the vertices or hooking elastic bands on for sides.

Place a mirror on to one axis and children to reflect the shape into another quadrant. Encourage the children to think about reversing the image and checking the distance and size. The children can then check this using the mirror. This activity may need some adult support. Repeat with other shapes and using 2 and 4 quadrant grids, reflecting in both the y and x axis for different shapes. To challenge the children, they can reflect one shape in the y axis and then reflect it again in the x axis.

**Green Practice: most suited for children who made errors in Question 6 of the prior learning assessment.**

The children are given shapes to reflect in the y and x axis and in mirror lines that are in different positions. The children are presented with a variety of shapes, in different orientations, to challenge them when reflecting. Encourage the children to work on a vertex at a time, looking at the distance from the mirror line and placing this in the correct place on the other side of the mirror line.

For fluency opportunities, the children can also be challenged to work out the area of the shapes by counting the spaces in the grid or discuss the angle of the vertices made by the coordinates. They could also work out the fraction or percentage of the grid filled with shapes.

**Yellow Practice most suited for children who demonstrate understanding of reflecting shapes in the x and y axis and would benefit from reflecting shapes on a diagonal mirror line.**

The yellow activity task sheet provides the opportunity for children to explore the position of shapes reflected on a diagonal mirror line. The children are also encouraged to draw their own diagonal mirror lines for some of the questions, applying accurate measuring of 45° angles using a protractor.

Diagonal reflection is difficult therefore children will benefit from using a mirror to reflect the image.

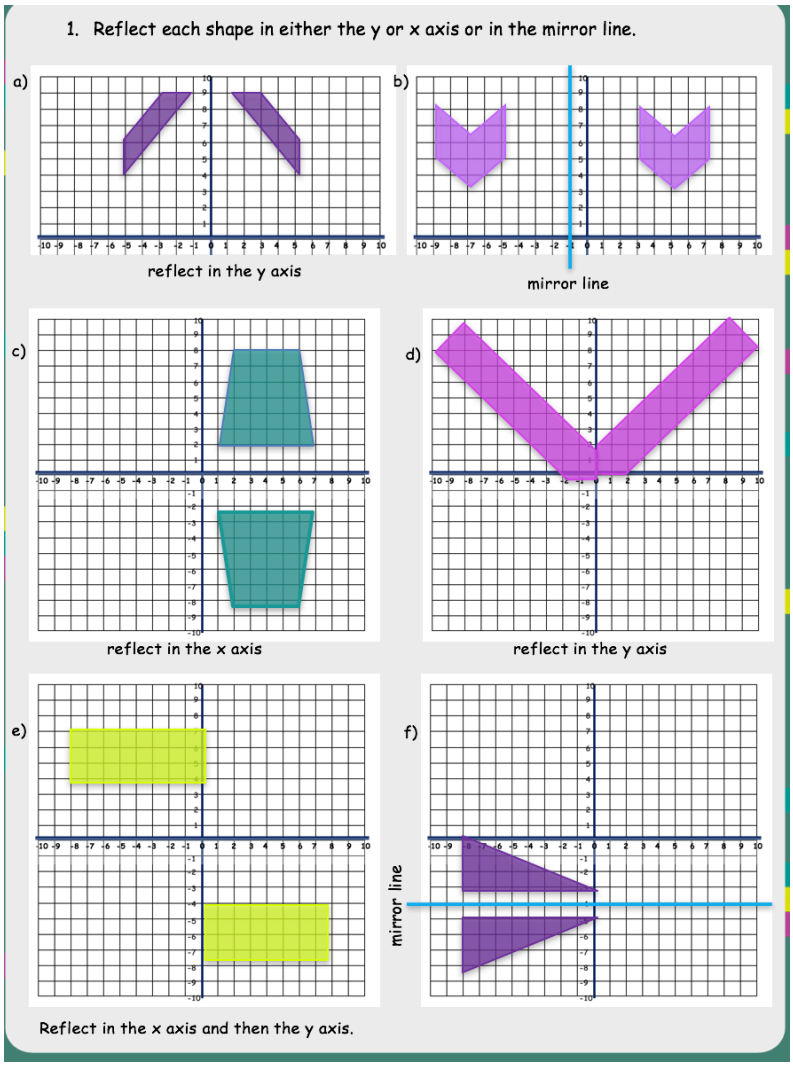
**Mastery**

For this mastery, the children are provided with the opportunity to investigate repeated reflection. The children are encouraged to select a shape at a time and reflect this on the y and x axis around the grid to investigate whether the shape can be reflected back to its original place/orientation. The children are also given the opportunity to reflect letters to help drawn conclusions from their findings.

Encourage the children to reflect the shapes on the y/x axis initially around the grid. What have they found out? Which shapes reflected to their original place and orientation? Why do you think this is? Is there any impact if we change the position of the mirror line (such as diagonally)?

**Answers:**

**Green:**



**Yellow:**

Mark together as a small group or class with mirrors to ensure that the children understand how an image is altered on a diagonal mirror line. The children should also use protractors to check that they have created a diagonal line through the centre by accurately measuring a 45° angle.

**Mastery**

Encourage the children to share their reflections and where they have placed the mirror line. Can they explain their findings?

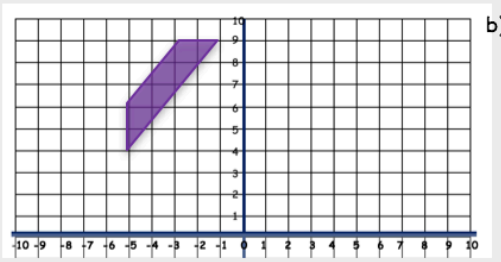
BRICKWORK Mathematics

Green Practice

Lo: I reflect shapes in the x and y axis and in mirror lines.

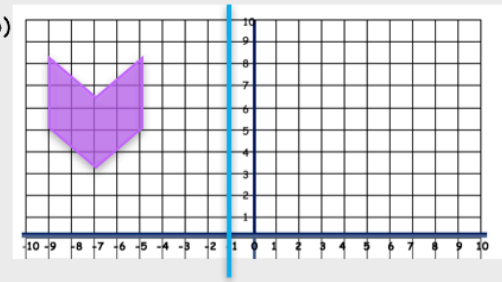
1. Reflect each shape in either the y or x axis or in the mirror line.

a)



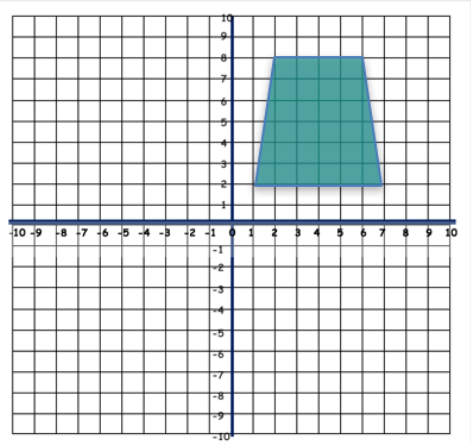
reflect in the y axis

b)



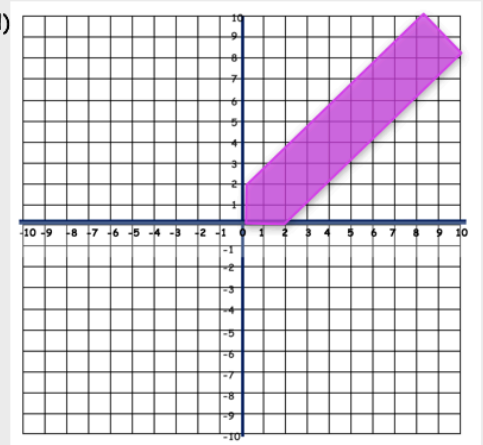
mirror line

c)



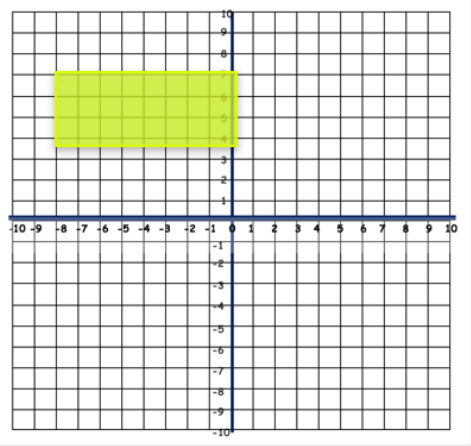
reflect in the x axis

d)

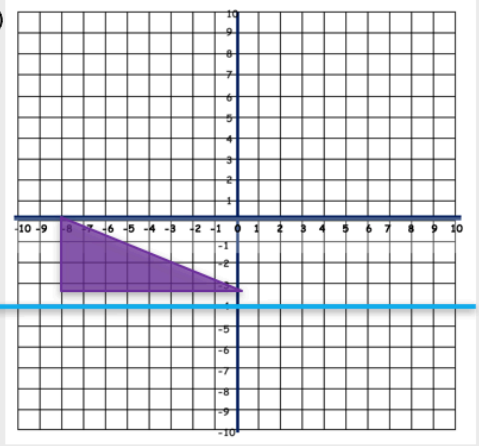


reflect in the y axis

e)



f)




Reflect in the x axis and then the y axis.

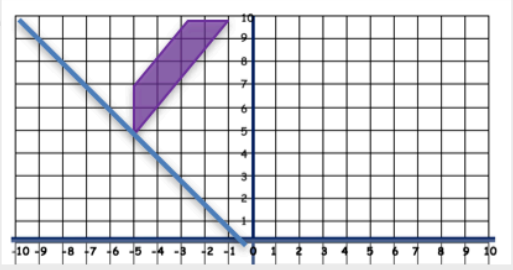
BRICKWORK Mathematics

Yellow Practice

Lo: I reflect shapes in mirror lines in different positions.

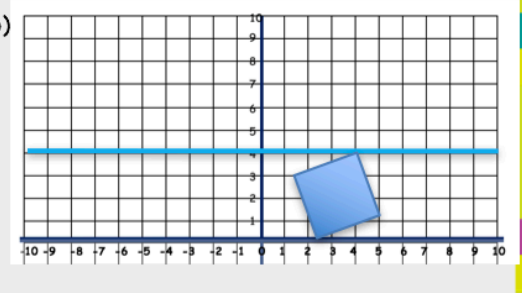
1. Reflect each shape in the mirror line. On some of the questions you are asked to draw your own mirror line. You will need a protractor.

a)



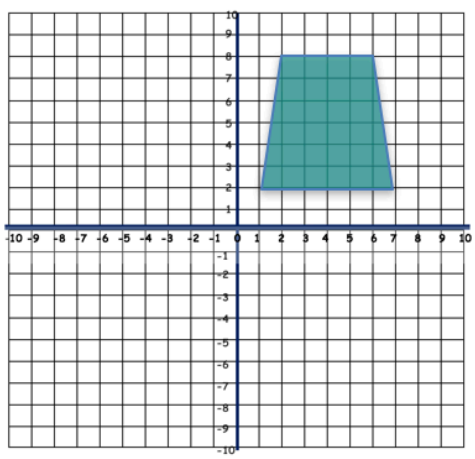
mirror line

b)



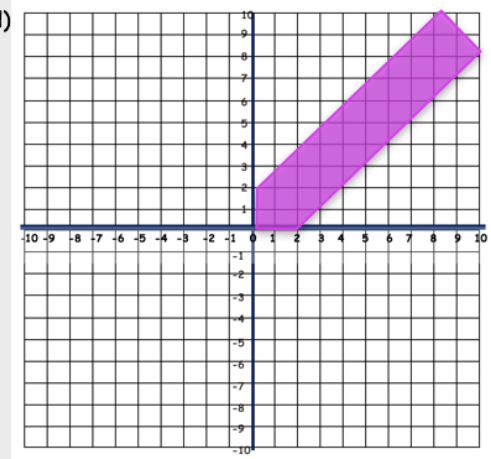
mirror line

c)



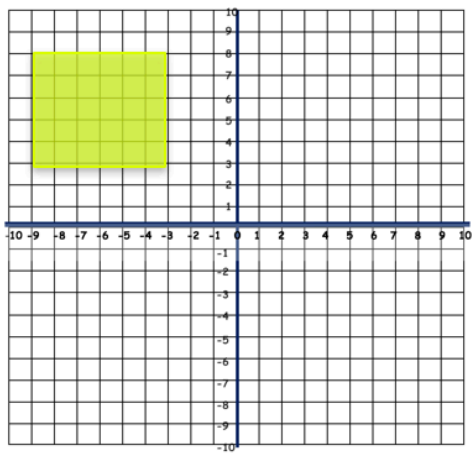
Place the mirror line at a 45°angle across the central point.

d)



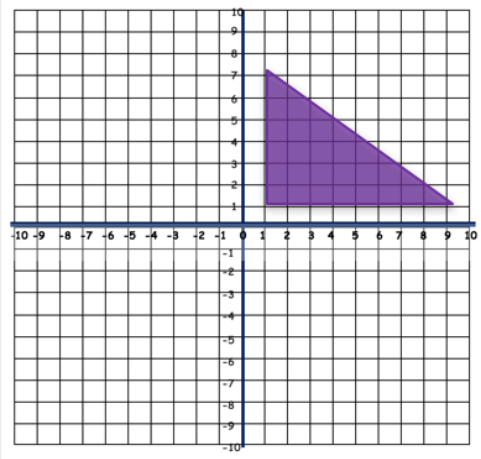
Place the mirror line at a 45°angle across the central point.

e)



Reflect in the x axis and then place the mirror line at a 45 °angle across the central point and reflect again.

f)



mirror line

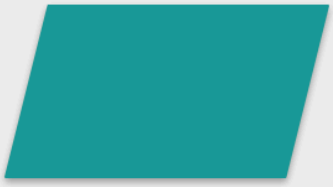
Reflect in the y axis and then place the mirror line at a 45 °angle across the central point and reflect again.

BRICKWORK Mathematics

Mastery

Investigate

Draw a 4-quadrant grid. Look at the 4 shapes below. Pick a quadrant to put your shape into. Now explore reflecting each shape in the y and x axis. Can you reflect the shape all the way around the grid back to its starting position?





**Challenge:**

1) Try this with a letter or your own choice.

2) Place the mirror line in different positions, not just on the x and y axis.