**Shape Unit 2**

**Problem solving and reasoning questions**

Without drawing a co-ordinate grid and plotting the points, say what each of these shapes are. Be as specific as you can.

(a) (2,1) (2,5) (6,1) (6,5)

(b) (1,1) (5,1) (3,6)

(c) (–1, –1) (–1, –3) (–3,0) (–5, –2) (–3, –4)

Now plot each set of co-ordinates and join them in the order given to create each shape to check your answers.

A triangle is translated so that it has moved 4 squares up the grid. Its co-ordinates are now: (2,0) (5,2) and (3,7).

Draw it in its original position.

(0,0) (5,0) (5,5) (0,5) is a shape.

When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not?

Sketch it to explain.

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Without drawing a co-ordinate grid and plotting the points, say what each of these shapes are. Be as specific as you can.

1. (2,1) (2,5) (6,1) (6,5)

It’s a quadrilateral as it has 4 vertices.

The difference between both the x- and y-values of the pairs of coordinates is 4 (6 - 2 and 5 - 1). This means that the 4 sides are the same length – the shape is a square.

1. (1,1) (5,1) (3,6)

It’s a triangle. It has a **horizontal** side as **two** of the vertices have a y-value of 1. The third vertex is half-way between the other two (its x-value of 3 is half way between 1 and 5), making this an isosceles triangle.

(c) (–1, –1) (–1, –3) (–3, 0) (–5, –2) (–3, –4)

It’s a pentagon, having 5 vertices. It sits in the 3rd quadrant, as all co-ordinate values are negative. One vertex sits on the x-axis, having a y-value of zero. Two pairs of co-ordinates are vertically in line with one another as they share the same x-value: (**-1**,-1) and (**-1**, -3); (**-3**, 0) and (**-3**, -4).

Now plot each set of co-ordinates and join them in the order given to create each shape to check your answers.

Look for accurately plotted shapes. Common misconceptions include plotting x and y values in the wrong order, and becoming confused with the negative co-ordinates in example (c).

A triangle is translated so that it has moved 4 squares up the grid. Its co-ordinates are now: (2,0) (5,2) and (3,7).

Draw it in its original position.

(2,-4) (5,-2) and (3,3). As it has moved **up**, each of the y

co-ordinates must have originally been 4 less than those given.

The x- values are unchanged by the move.

(0,0) (5,0) (5,5) (0,5) is a shape.

When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not? (0,0) and (0,5) do not move as they are located on the y-axis itself.

Sketch it to explain. As before, look for accurately plotted shapes.