

Polygon co-ordinates

Sheet 2

Use a ruler to draw axes for each question, like the ones used earlier in the lesson.

1. Plot the three points. Work out the fourth point to make a square. Write down its co-ordinates. Draw the square. Use a different colour for each.

- a) $(-1, 2), (1, 2), (1, 0), (\quad, \quad)$
- b) $(-2, 9), (1, 9), (1, 6), (\quad, \quad)$
- c) $(-1, 7), (-1, 3), (3, 3), (\quad, \quad)$
- d) $(-3, 5), (-7, 1), (-7, 5), (\quad, \quad)$

2. Plot three points and work out the fourth point to make a rectangle. Write down its co-ordinates. Draw the rectangle. Use a different colour for each.

- a) $(-4, 5), (7, 6), (-4, 6), (\quad, \quad)$
- b) $(4, 2), (-3, 2), (4, 4), (\quad, \quad)$
- c) $(-6, 6), (1, 6), (1, 10), (\quad, \quad)$
- d) $(5, 1), (10, 1), (5, 4), (\quad, \quad)$

3. Plot and join these points. Use a different colour for each. Write what each polygon is.

- a) $(-2, 5), (1, 4), (1, 6), (4, 5)$
- b) $(7, 2), (8, 3), (-2, 3), (-1, 4)$
- c) $(-6, 6), (-6, 8), (1, 7), (2, 8), (1, 9),$
- d) $(-1, 9), (2, 9), (3, 1), (2, 0), (-1, 0), (-2, 1)$

Challenge

Plot a trapezium and write down all its co-ordinates.

Now try this again. This time you are not allowed to use the same y value twice.

If you managed this with the first one, draw a trapezium that does not use the same x or y value twice...

Translations

Sheet 1

Choose five different coloured pencils.

Join the first set of points using one colour, then translate the shape, marking its new position in the same colour.

Write the new co-ordinates at each vertex.

Repeat for each set of points in a different colour.

1. $(1, 1), (1, 4), (5, 4), (5, 1)$. Translate the shape 2 squares to the left.
2. $(1, 9), (2, 8), (4, 8), (5, 9), (4, 10), (2, 10)$. Translate the shape 3 squares down.
3. $(-5, 5), (-5, 6), (-2, 5)$. Translate the shape 4 squares to the right.
4. $(-8, 1), (-6, 3), (-2, 3), (-4, 1)$. Translate the shape 5 squares to the right.
5. $(6, 6), (7, 7), (9, 7), (10, 6)$. Translate the shape 5 squares to the left.

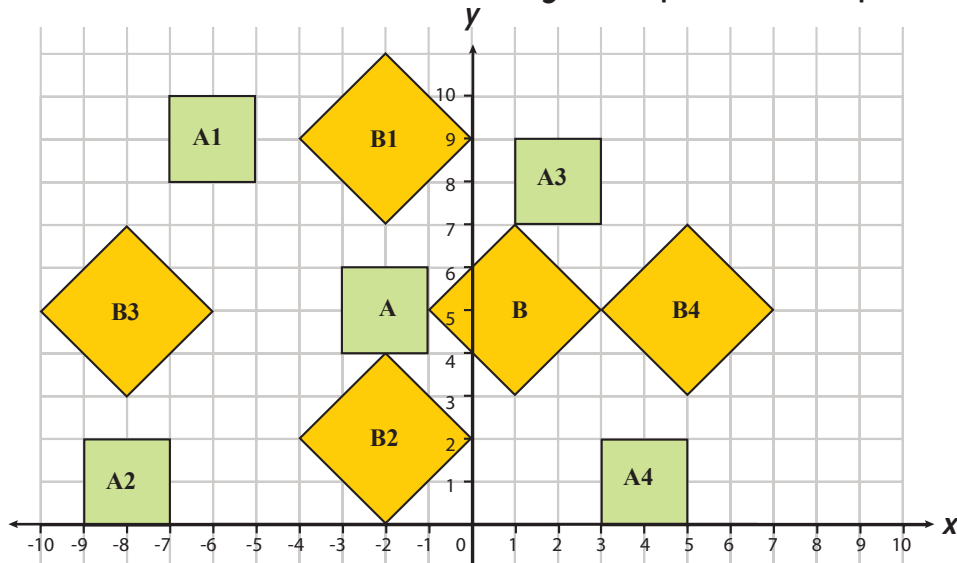
What happens to the co-ordinates when you move a shape up? And down?

What happens when you move a shape to the left? And right?

Pattern of translations

Sheet 2

Here is a pattern made with translations, starting with square A and square B.



- Work out how each shape has been translated.
Fill in the table to show the moves.
How many squares in the x-direction? Is it to the left or right?
How many squares in the y-direction? Is it up or down?

| Original shape | Translated shape | Squares in x direction | Squares in y direction |
|----------------|------------------|------------------------|------------------------|
| Square A | Square A1 | <i>4 to the left</i> | <i>4 up</i> |
| Square A | Square A2 | | |
| Square A | Square A3 | | |
| Square A | Square A4 | | |
| Square B | Square B1 | | |
| Square B | Square B2 | | |
| Square B | Square B3 | | |
| Square B | Square B4 | | |

Challenge

Here are the descriptions of two more translations.

What are the co-ordinates of the translated shapes?

- Square A \longrightarrow Square A5 3 squares to the left, 5 squares up
- Square B \longrightarrow Square B5 6 squares to the right, 2 squares down