Reasoning and Problem Solving
Step 2: Four Quadrants

National Curriculum Objectives:

Mathematics Year 6: (6P3) Describe positions on the full coordinate grid (all four quadrants)

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Spot the mistake where the coordinates are supposed to make squares or rectangles, using two quadrants.
Expected Spot the mistake where the coordinates are supposed to make quadrilaterals, using all four quadrants.
Greater Depth Spot the mistake where the coordinates are supposed to make polygons, using all four quadrants where shapes cross quadrants.

Questions 2, 5 and 8 (Problem Solving)
Developing Follow the three clues to find the coordinates of the rectangle or triangle using two quadrants. Clues include the shape name and one missing point is given.
Expected Follow the three clues to find the coordinates of the quadrilateral using all four quadrants. Clues are given as to which quadrant the shape will be drawn in and one missing point is given.
Greater Depth Follow the four clues to find the coordinates of the quadrilateral or regular polygon using all four quadrants where shapes cross the quadrants and more than one shape could be made.

Questions 3, 6 and 9 (Reasoning)
Developing Write the missing coordinate for a square using two quadrants (no grid lines given).
Expected Write the missing coordinates for a pentagon or hexagon using all four quadrants (no grid lines given).
Greater Depth Write the missing coordinates for a polygon (which overlaps the quadrants) using all four quadrants (no grid lines given).
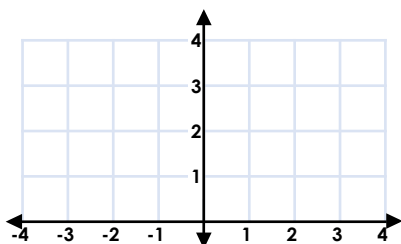
More Year 5 and Year 6 Position and Direction resources.

Did you like this resource? Don't forget to review it on our website.

Four Quadrants

1a. Eliza thinks that the coordinates below make a square.
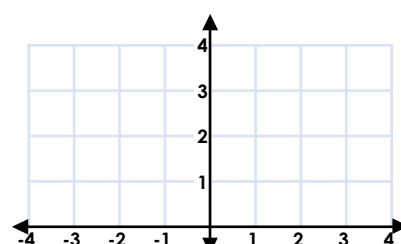
(1, 1)
(3, 1)
(1, 3)
(3, 4)

Is she correct? Explain why.

6 R

1b. Jacob thinks that coordinates below make a rectangle.
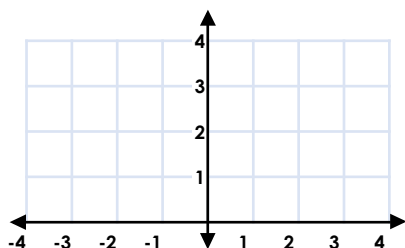
(-3, 1)
(-3, 4)
(-1, 2)
(-1, 4)

Is he correct? Explain why.

6 R

2a. Follow the clues. What could the coordinates of the shape be?
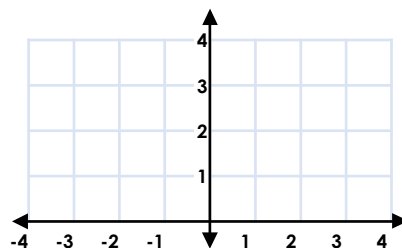
- The shape is a rectangle.
- The shape is in one quadrant.
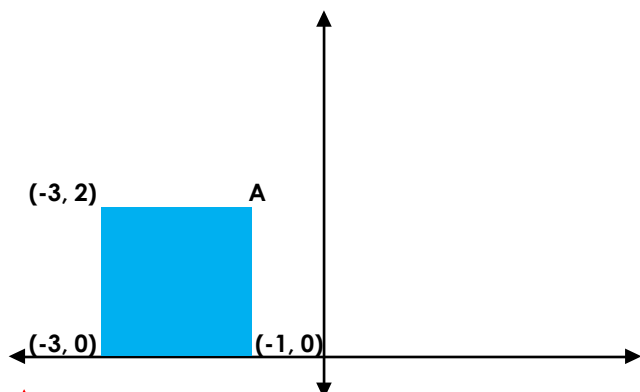- One of the points is (1, 2).

6 PS

2b. Follow the clues. What could the coordinates of the shape be?

- The shape has some negative coordinates.
- The shape is a triangle.
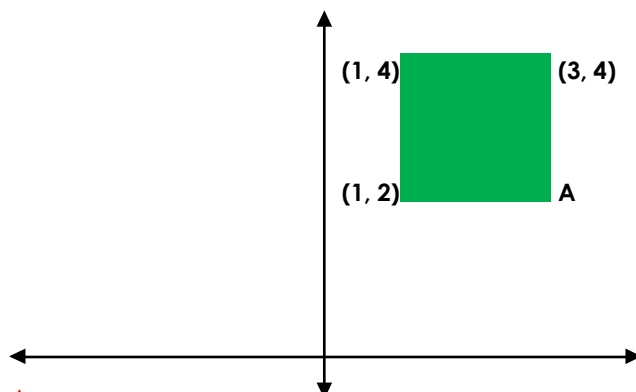- One of the points is (-2, 3).

6 PS

3a. Here is a square. Use the given coordinates to find the coordinates of points A.

(-3, 2)   A

(-3, 0)   (-1, 0)

6 R

3b. Here is a square. Use the given coordinates to find the coordinates of points A.

(1, 4)   (3, 4)

(1, 2)   A
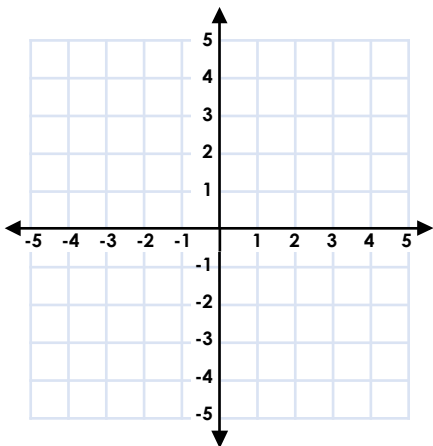
6 R

4a. Holly thinks that the coordinates below make a parallelogram.

(-3, 3)
(-1, 2)
(-4, -2)
(-1, -3)
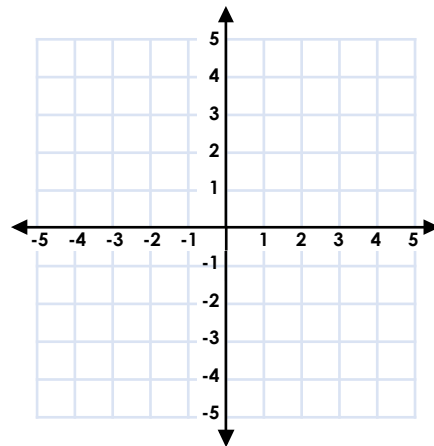
Is she correct? Explain why.

6 R

4b. Max thinks that the coordinates below make a trapezium.
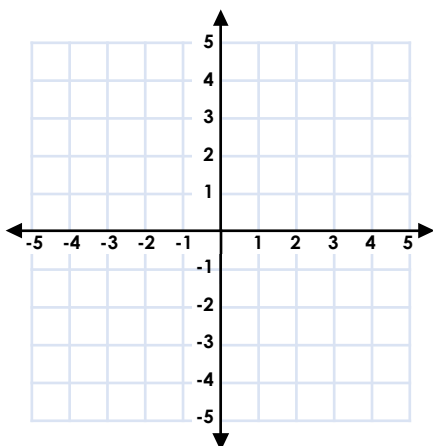
(-3, 2)
(-2, 4)
(3, 5)
(4, 2)

Is he correct? Explain why.

6 R

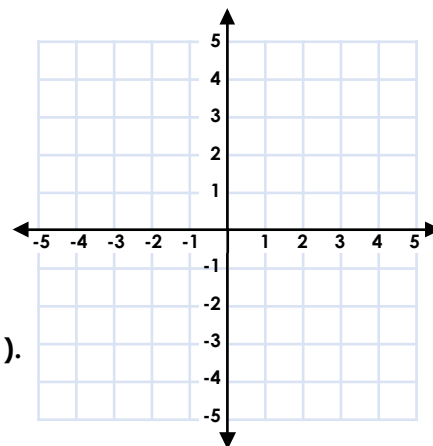**5a.** Follow the clues. What could the coordinates of the shape be?

- The shape is a rhombus.
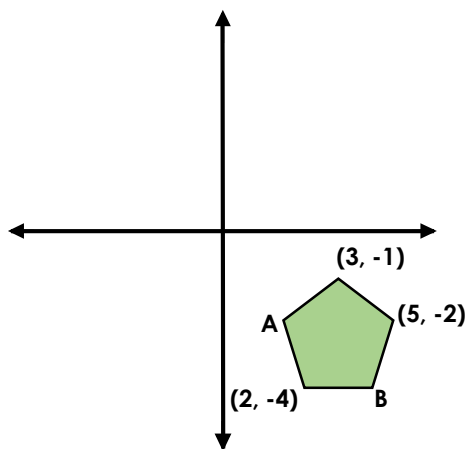- The shape is in one quadrant.
- One of the points is (2, -1).

6 PS

5b. Follow the clues. What could the coordinates of the shape be?

- The shape has only negative coordinates
- The shape is a kite.
- One of the points is (-3, -1).

6 PS

6a. Here is a pentagon with a vertical line of symmetry. Use the given coordinates to find the coordinates of points A and B.
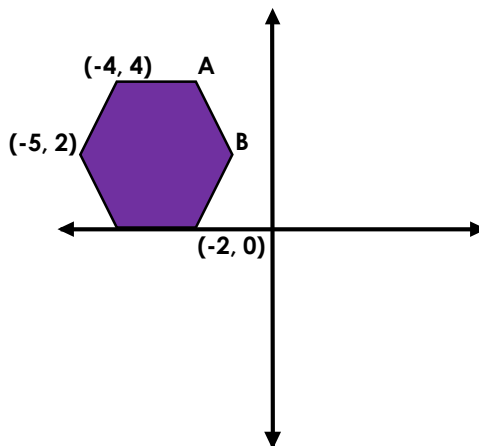
(3, -1)
(5, -2)
A
(2, -4) B

6 R

6b. Here is a hexagon with a vertical line of symmetry. Use the given coordinates to find the coordinates of points A, B and C.

(-4, 4) A
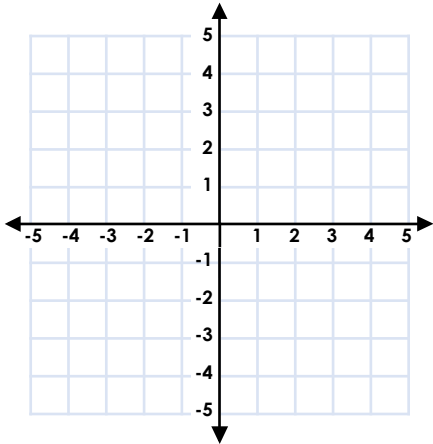(-5, 2) B
(-2, 0)

6 R

classroomsecrets.co.uk

Reasoning and Problem Solving – Four Quadrants – Year 6 Expected

7a. Sam thinks that the coordinates below make a hexagon with a vertical line of symmetry.

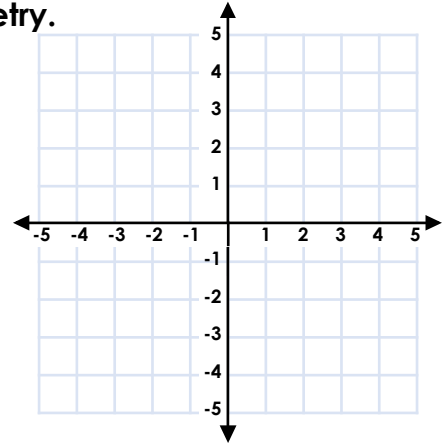| (-1, -1) |
|---|
| (1, -1) |
| (2, 1) |
| (-2, 1) |
| (2, 3) |
| (-1, 3) |

Is he correct? Explain why.

6 R

7b. Daisy thinks that the coordinates below make a pentagon with a vertical line of symmetry.

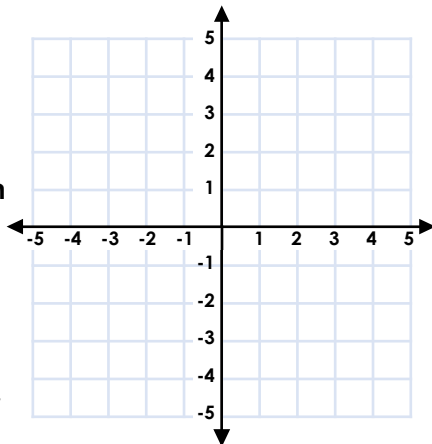| (0, 1) |
|---|
| (2, 0) |
| (1, -1) |
| (-1, -2) |
| (-2, 0) |

Is she correct? Explain why.

6 R

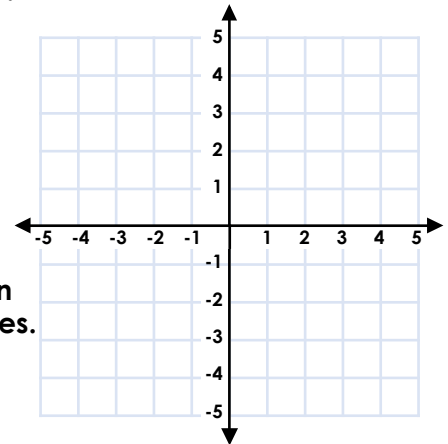**8a.** Follow the clues. Which shapes could you draw? What could the coordinates of the shapes be?

- The shape has one pair of parallel sides.
- The shape has fewer sides than a hexagon.
- The shape crosses two quadrants.
- One of the points is (-3, -4).

6 PS

8b. Follow the clues. Which shapes could you draw? What could the coordinates of the shapes be?

- The shape is a regular polygon.
- The shape crosses all four quadrants.
- At least three points have 0 in their coordinates.
- One of the points is (2, 2).

6 PS

9a. Here is an octagon. Use the given coordinates to find the coordinates of points A, B, C and D.

D   (1, 4)
C   (3, 2)
(-3, 0)   A
(-1, -2)   B

6 R

9b. Here is an dodecagon. Use the given coordinates to find the coordinates of points A, B, C and D.

(-2, 4)   (1, 4)
(-5, 1)   D   A   (4, 1)
(-5, -2)   C   B   (4, -2)
(-2, -5)   (1, -5)

6 R

classroomsecrets.co.uk

Reasoning and Problem Solving – Four Quadrants – Year 6 Greater Depth

Reasoning and Problem Solving
Four Quadrants

Developing

1a. Eliza is not correct because (3, 4) should be (3, 3) to make a square.

2a. Various answers, for example:
(1, 2); (1, 4); (4, 2); (4, 4) or
(1, 2); (4, 2); (1, 0); (4, 0) or
(1, 2); (1, 3); (4, 3); (4, 2) or
(1, 2); (1, 1); (4, 1); (4, 2)

3a. Use the coordinates that are given to deduce that A = (-1, 2).

Developing

1b. Jacob is not correct because (-1, 2) should be (-1, 1) to make a rectangle.

2b. Various answers, for example:
(-2, 3); (-3, 1); (-2, 1) or
(-2, 3); (-3, 1); (-1, 1) or
(-2, 3); (-2, 1); (-1, 1) or
(-2, 3); (-4, 3); (-3, 1)

3b. Use the coordinates that are given to deduce that A = (3, 2).

Expected

4a. Holly is not correct because (-2, -4) should be (-2, -3) to make a parallelogram.

5a. Various answers, for example:
(2, -1); (4, -1); (1, -3); (3, -3) or
(2, -1); (5, -1); (1, -4); (4, -4) or
(2, -1); (4, -2); (2, -3); (4, -4) or
(2, -1); (5, -2); (2, -4); (5, -5)

6a. Use the coordinates that are given to deduce that A = (1, -2); B = (4, -4).

Expected

4b. Max is not correct because (-2, 4) should be (-2, 5) or (3, 5) should be (3, 4) to make a trapezium.

5b. Various answers, for example:
(-3, -1); (-5, -4); (-1, -4); (-3, -5) or
(-3, -1); (-5, -3); (-2, -3); (-3, -4) or
(-3, -1); (-4, -3); (-2, -3); (-3, -4) or
(-3, -1); (-5, -2); (-1, -2); (-3, -5)

6b. Use the coordinates that are given to deduce that A = (-2, 4); B = (-1, 2).

Greater Depth

7a. Sam is not correct because (2, 3) should be (1, 3) to make a hexagon with a vertical line of symmetry.

8a. Various answers, for example:
A trapezium: (-3, -4); (-2, -2); (2, -2); (3, -4)
or (-3, -4); (-2, -2); (-2, 1); (-4, 3)
or (-3, -4); (-2, -2); (1, -2); (2, -4)
or (-3, -4); (-2, -2); (0, -2); (1, -4)
An irregular pentagon: (-3, -4); (-3, -3); (-2, -1); (1, -1); (2, -4)

9a. Use the coordinates that are given to deduce that A = (3, 0); B = (1, -2); C = (-3, 2); D = (-1 4).

Greater Depth

7b. Daisy is not correct because (-1, -2) should be (-1, -1) to make a pentagon with a vertical line of symmetry.

8b. Various answers, for example:
hexagon: (2, 2); (0, 2); (-1, 0); (0, -2); (2, -2); (3, 0)
octagon: (2, 2); (0, 2); (-1, 0); (1, -2); (0, -4); (2, -4); (3, -2); (3, 0)
pentagon: (2, 2); (2, 0); (0, -1); (-2, 1); (0, 3)

9b. Use the coordinates that are given to deduce that A = (1, 1); B = (1, -2); C = (-2, -2); D = (-2, 1).