COORDINATE AND GRAPH PROBLEMS

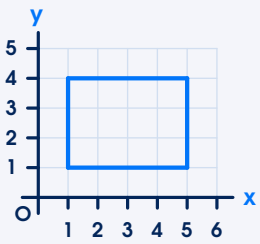
BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

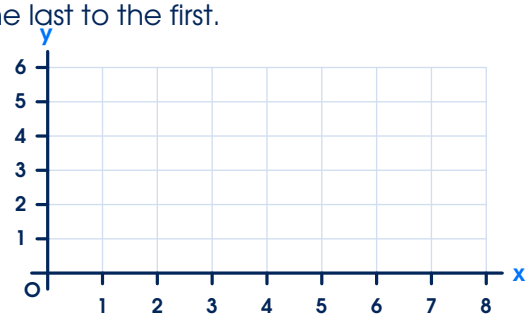
Solving a problem? Take it one step at a time.

1. Draw it or mark it on the grid.
2. Write down what you know.
3. What can you work out?



1 a) Plot these points. Join them in order, then join the last to the first.

(1, 1) (8, 1) (8, 4) (1, 4)



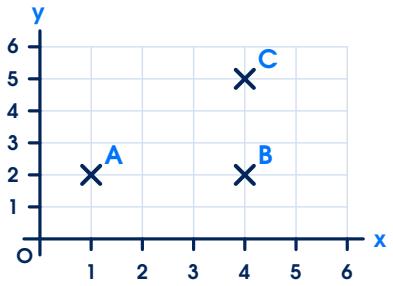
b) What shape have you made?

SQUARE RECTANGLE TRIANGLE

c) Count the squares inside. Area = ☐

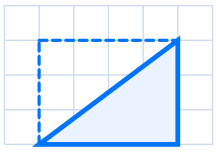
2 A, B and C are three corners of a square.

A square has all sides the same length. Mark the 4th corner D with a cross.



b) D is at (,)

3 Find the area of the shaded triangle.



The triangle is half of the dashed rectangle.

a) Area of the rectangle = ☐

b) Area of the triangle = ☐

4 Does each point fit the rule y = x + 3?

(2, 5)

2 + 3 = ☐

FITS DOES NOT

(4, 6)

4 + 3 = ☐

FITS DOES NOT

(0, 3)

0 + 3 = ☐

FITS DOES NOT

COORDINATE AND GRAPH PROBLEMS

SUPPORT

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KEY IDEA

Use everything you know: coordinates, rules of lines, area and the properties of shapes.

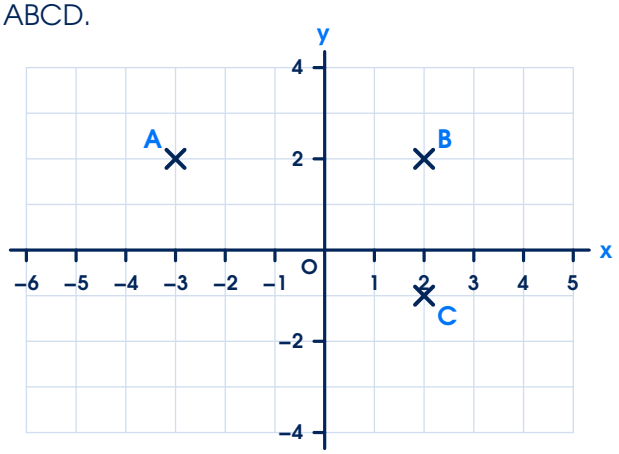
A sketch helps. Mark what you know, then look for what you can work out.

1 A, B and C are three corners of a rectangle ABCD.

a) D is at (,)

b) Perimeter = ____

c) Area = ____



2 Tick the points that lie on the line y = 3x – 2

(1, 1) ☐ **(2, 4)** ☐ **(3, 6)** ☐

(0, –2) ☐ **(–1, –5)** ☐

Write one more point on the line: (,)

3 Where does the line y = 2x + 1 meet each of these lines?

a) **x = 4** (,)

b) **y = –3** (,)

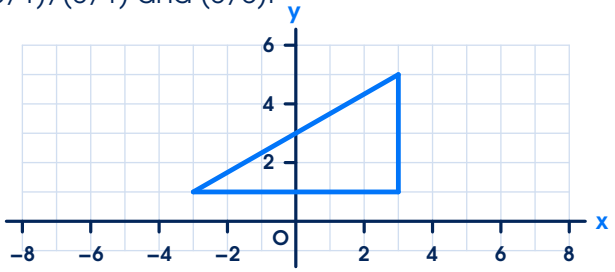
c) **the y-axis** (,)

4 Find the area of the triangle with corners (–3, 1), (3, 1) and (3, 5).

a) Length of the base = ____

b) Height = ____

c) Area = ½ × base × height = ____



COORDINATE AND GRAPH PROBLEMS

CORE

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KEY IDEA

Ask: What do I know? What can I work out? Would a sketch help? Check the scales.

FLUENCY

1 Triangle ABC is isosceles with A (−1, 2) and B (5, 2). C lies on the line x = 2 and the area of the triangle is 15 square units.

a) How long is the base AB? ☐

b) Find both possible positions of C. (,) (,)

2 The line y = x + 2, the line x = 4 and the x-axis make a triangle.

a) Find the coordinates of the three corners.

(,) (,) (,) **b)** Area ☐

REASONING

3 A line has the equation y = 4x − 3

a) Is (5, 18) on the line? Show how you know. ☐

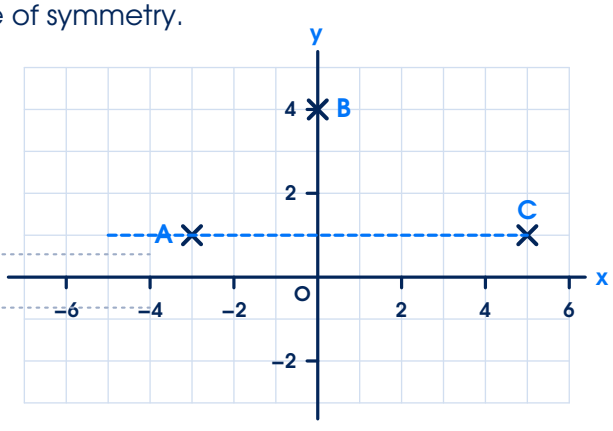
b) Where does the line meet x = 6? (,)

c) Where does the line meet y = 37? (,)

4 ABCD is a kite. The dashed line y = 1 is its line of symmetry.

a) D is at (,)

b) Explain how you know.



COORDINATE AND GRAPH PROBLEMS

GREATER DEPTH

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REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) Three points on the same straight line make a triangle. ALWAYS SOMETIMES NEVER

b) The point (a, 2a + 1) lies on the line y = 2x + 1 ALWAYS SOMETIMES NEVER

c) A line y = mx + c crosses the x-axis. ALWAYS SOMETIMES NEVER

d) Any two different points have exactly one midpoint. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 ABCD is a parallelogram. A is (1, 2), B is (7, 2) and C is (9, 6).

a) Find D. (,)

b) Find the area of ABCD. ____

3 The lines y = 2x + 4 and y = 7 – x meet at the point P.

a) Find P. (,)

b) Find the area of the triangle made by the two lines and the x-axis. ____

★ CHALLENGE FOR ALL

4 A straight line passes through (2, 3) and (8, 15). Find:

a) the midpoint (,)

b) the gradient ____

c) the equation y = ____

d) where it crosses the x-axis (,)

COORDINATE AND GRAPH PROBLEMS

ANSWERS

BUILDING BLOCKS

1 a) Plotted and joined · b) rectangle · c) 7 × 3 = 21 squares
2 a) Cross at (1, 5) · b) (1, 5)
3 a) 12 · b) 6
4 (2, 5): 5, fits · (4, 6): 7, does not fit · (0, 3): 3, fits

SUPPORT

1 a) (–3, –1) · b) 5 + 3 + 5 + 3 = 16 units · c) 15 square units
2 Tick (1, 1), (2, 4), (0, –2), (–1, –5); (3, 6) is not on it (y = 7) · e.g. (4, 10)
3 a) (4, 9) · b) (–2, –3) · c) (0, 1)
4 a) 6 · b) 4 · c) 12 square units

CORE

1 a) 6 · b) height 5, so C (2, 7) or C (2, –3)
2 a) (–2, 0), (4, 0), (4, 6) · b) ½ × 6 × 6 = 18 square units
3 a) No: 4 × 5 – 3 = 17, not 18 · b) (6, 21) · c) (10, 37)
4 a) (0, –2) · b) D is the reflection of B in y = 1: B is 3 above the line, so D is 3 below it.

GREATER DEPTH

1 a) Never: they lie on one line · b) Always: y = 2a + 1 · c) Sometimes: y = 2x + 1 does, but y = 3 (m = 0) never does · d) Always
2 a) D (3, 6) · b) base 6 × height 4 = 24 square units
3 a) 2x + 4 = 7 – x, so x = 1 and P = (1, 6) · b) the lines cross the x-axis at –2 and 7: ½ × 9 × 6 = 27 square units
4 a) (5, 9) · b) 12 ÷ 6 = 2 · c) y = 2x – 1 · d) (0.5, 0)