

5.7 The Cartesian plane

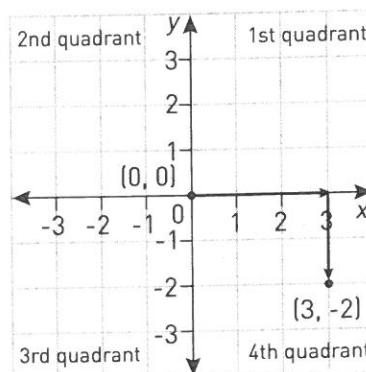
The **Cartesian plane** is a grid that has two intersecting number lines called the x -axis (horizontal) and the y -axis (vertical). Any position on the plane can be shown using a pair of coordinates. A pair of coordinates has an x -value (always written first) and a y -value. It is also called an **ordered pair** (x, y) .

Plotting an ordered pair

e.g. Plot $(3, -2)$.

- 1 Start at $O(0, 0)$. This is the **origin**.
- 2 Look at the x -value $(3, -2)$. Move right 3 units.
- 3 Look at the y -value $(3, -2)$. Move down 2 units.
- 4 Mark the position and write the ordered pair next to the point.

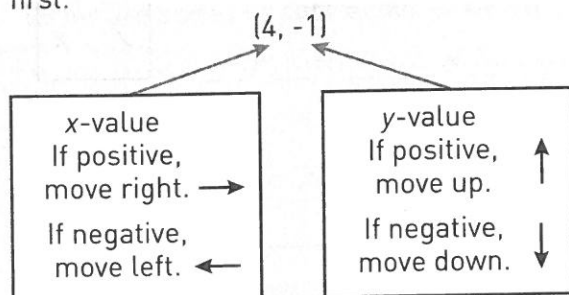
The point $(3, -2)$ is in the 4th quadrant.



Word Bank

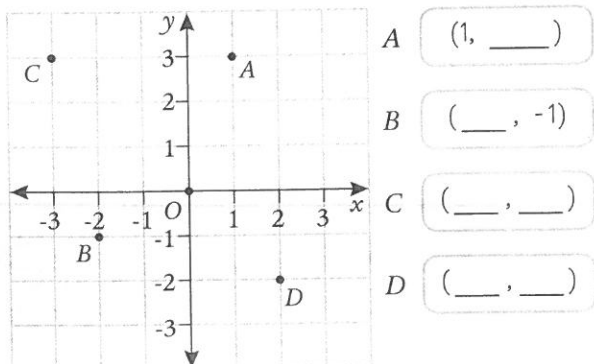
Ordered pair

→ An x -value and a y -value used to describe an exact position on a Cartesian plane is called an ordered pair. It is in the form (x, y) . The x -value is always stated first.

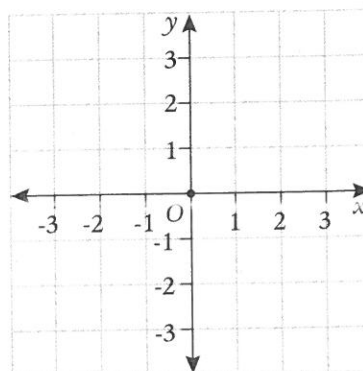


- 1 Write the **coordinates** of the points on the Cartesian plane.

Tip The x -value is written first in an ordered pair.



- 2 Starting at $(0, 0)$, state the ordered pair for the following positions.



- a Move 1 unit right and 3 units up.

(__ , __)

- b Move 3 units right and no units up or down. (This point is on the x axis.)

(__ , 0)

- c Move 2 units left and 1 unit up.

(__ , __)

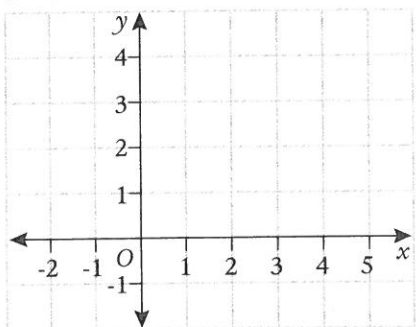
- d Move no units left or right and 3 units down. (This point is on the y -axis.)

(0 , __)

- 3 Plot and label these points on the Cartesian plane below.

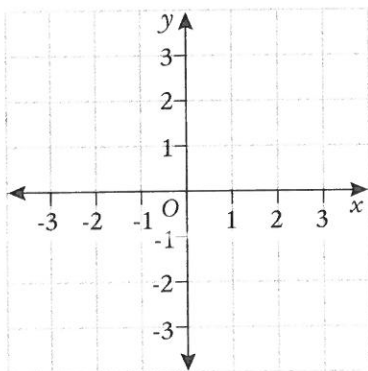
Tip Start at (0, 0) and 'walk before you jump'. Walk to the x-value left or right and then jump up or down to the y-value.

- a (4, 2) b (-2, 0) c (-2, 3)



- 4 a Plot the following points and join them with a straight line.

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

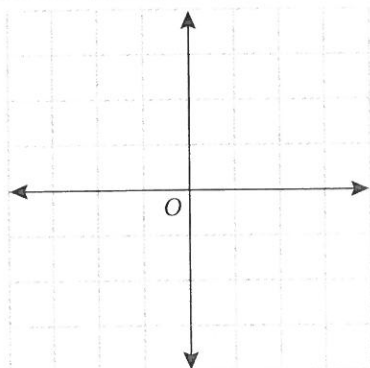


- b State the coordinates of another point that lies on the line.

(__, __)

- 5 a Draw a Cartesian plane from -3 to 3 on both axes.

Tip Cartesian plane 'must dos':
 1 Use a ruler to rule the axes.
 2 Space the numbers evenly on the axes.
 3 Label the x- and y-axes.

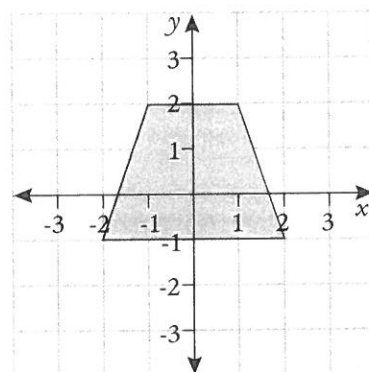


- b Join the points in order.

Start at (2, 1). Join (2, 1) → (0, 3) → (-2, 1) → (-1, -2) → (1, -2) → (2, 1).

- c What shape is created?

- 6 Look at the Cartesian plane below.



- a Label the ordered pair at each vertex (point) of the shape on the Cartesian plane above.

- b Write a list of instructions using ordered pairs to draw the shape above.

Start at (,). Join (,) → (,) → (,) → (,).

- c What shape is drawn on the Cartesian plane in part a?

NAPLAN-ready

Shade the box beneath the correct answer.

On a Cartesian plane, an ant is sitting at (3, 4). It sees a drop of honey at (0, 4) and walks in a direct line to it.

In which direction did the ant walk to reach the honey?

Right Left Up Down

Tip Which number in the ordered pair has changed—the x or the y? Has the changed number gone up or down?