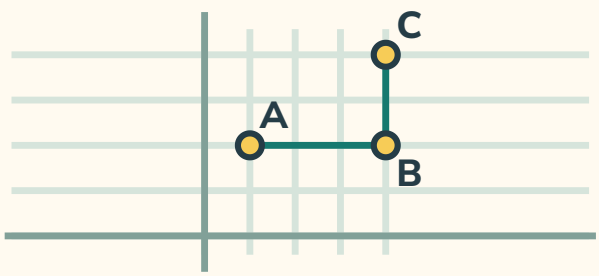
MATHS FIELD GUIDE · GRADE 5

Coordinates name a position

OPENING PROBLEM

Describe A to C via B.



A (1, 2)
B (4, 2)
C (4, 4)

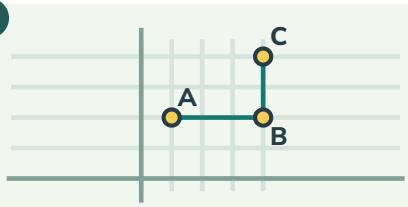
02 Read a point, a route and its image
03 Rules and worked cases
04 Find the water station
05 Compare the models
06 Treat an ordered pair as two instructions
07 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Read a point, a route and its image

Read horizontal position first and vertical position second.

1

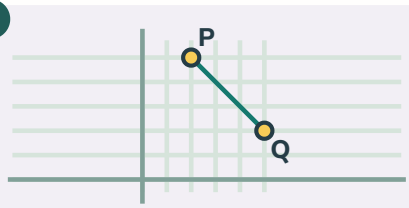


A (1, 2)
B (4, 2)
C (4, 4)

Describe A to C via B.

Go three right, then two up. The total route length is five grid units.

2

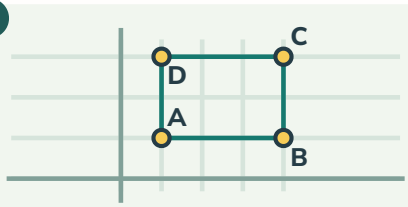


P (2, 5)
Q (5, 2)

Are the points the same if the coordinates swap?

No. Each has its horizontal and vertical distances exchanged.

3

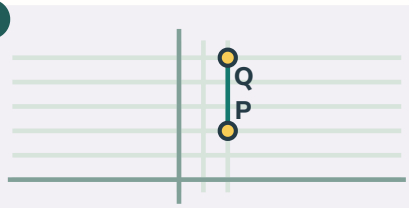


A (1, 1)
B (4, 1)
C (4, 3)
D (1, 3)

How can you recognise this rectangle?

Opposite sides have the same lengths. Horizontal and vertical neighbours meet at right angles.

4



P (2, 2)
Q (2, 5)

Must both coordinates change when a point moves?

No. A vertical move keeps x fixed and adds three to y.

All points on x = 3
a vertical line.

All points on y = 3
a horizontal line.

CHAPTER PROBLEM

A point has coordinates (0, 6). Which axis contains it?

The y-axis, because the horizontal coordinate is zero.

MATHS REFERENCE · GRADE 5

Coordinates name a position

Coordinates locate a point using reference axes.

In an ordered pair (x, y), the first number gives horizontal position and the second gives vertical position.

Cases to recognise

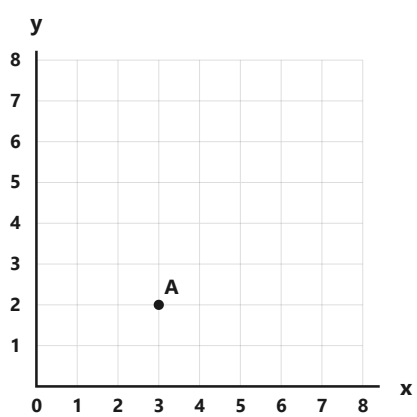
Situation	What to do and why
Plot (0, 4)	Stay on the vertical axis and move four up.
From (3, 2) to (7, 2)	The y-value stays two. Travel four units right.

Read the model

Begin at the origin

The axes meet at the origin, (0, 0).

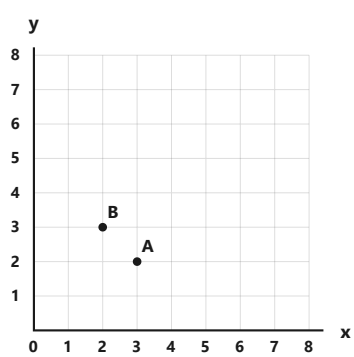
To plot A at (3, 2), begin there, go three units right and two units up. Mark the endpoint.



The order matters

B at (2, 3) is two units right and three units up.

A and B occupy different points. Swapping the order usually changes the position.



axis A reference number line.
origin Where both coordinates are zero.
ordered pair Two numbers with assigned horizontal and vertical roles.

3 7 11 15 ?

What is the next term if the rule is add four?

Nineteen. Each gap is four.

WORKED INVESTIGATION

Find the water station

On a grid map start at the origin (0, 0). A water station at (4, 2) is four steps right and two up. Each square is one step.

Look at this part	What it tells you
Start	(0, 0)
Four right	(4, 0)
Two up	(4, 2)

Work it through

A station at (2, 4) lies elsewhere. Draw both routes and compare their distances from the horizontal axis.

Catch the mistake

Reading the vertical number first swaps the landmarks. Trace a horizontal route before turning vertically.

Compare the cases

Count intervals, not lines

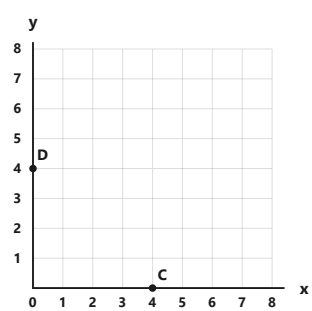
Moving from zero to three crosses three unit intervals.

Do not count the zero line as the first unit. Read the labelled scale.

Points can lie on an axis

C at (4, 0) lies on the horizontal axis. D at (0, 4) lies on the vertical axis.

A zero coordinate means no movement in that direction.



Change one condition

A bench is three steps above the first station. Its horizontal position stays four, so the bench is at (4, 5).

Position	1	2	3	4
Term	3	7	11	15

How do you reach term 4 straight from term 1?

Start at 3 and add three jumps of 4. The result is 15.

COORDINATES NAME A POSITION

Compare the models

Look for coordinate patterns

Points (1, 2), (2, 2) and (3, 2) lie at the same height.

Their y-coordinate stays two. Changing x moves along a horizontal line.

Name positions, not just routes

Right then up is a helpful plotting route.

Up then right reaches the same endpoint, but the ordered pair is still written horizontal position first.

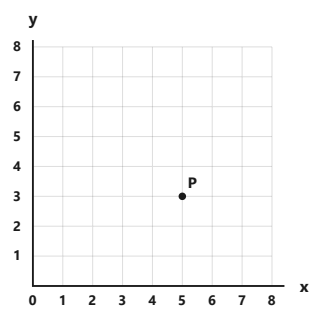
Keep the Grade 5 boundary

Here we use non-negative coordinates in the first quadrant and on the axes.

Negative coordinates and the full four-quadrant plane belong to the default Grade 6 sequence.

Explain your reasoning

Read the coordinates of point P.



P is (5, 3): five units right, three units up.

Two more worked cases

Situation	Reasoning
Complete rectangle (1,1), (6,1), (6,4), __	Return to x = 1 while keeping y = 4. Use (1,4).
Swap (2,5) to (5,2)	The horizontal and vertical distances from the axes exchange.

22 17 12 7 ?

Can the jump be negative?

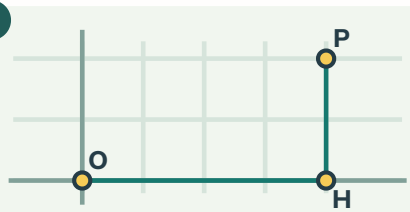
Yes. Subtract five each time. The next term is 2.

ILLUSTRATED PROBLEM SHEET

Treat an ordered pair as two instructions

Start at the origin. Use the horizontal coordinate before the vertical one.

1

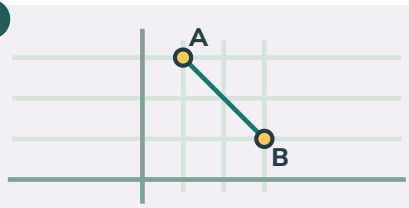


O (0, 0)
H (4, 0)
P (4, 2)

Trace the route to (4,2).

Four units right, then two up. The point is where the two readings agree.

2

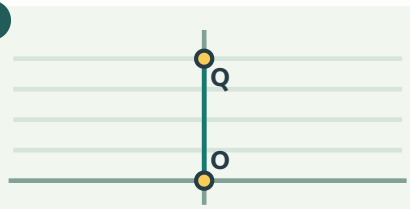


A (1, 3)
B (3, 1)

Is (1,3) the same point as (3,1)?

The first point is one right and three up. Swapping the instructions gives the other point.

3

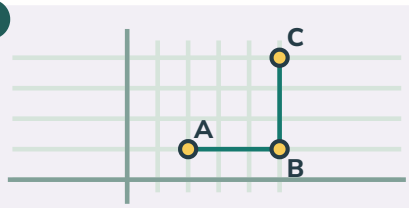


O (0, 0)
Q (0, 4)

What does a zero first coordinate mean?

There is no horizontal move. The point lies on the vertical axis.

4



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

A route starts at (2,1), goes three right and three up. Where does it finish?

At (5,4). The two legs show which coordinate changes each time.

(0,3)
on the vertical axis.

(3,0)
on the horizontal axis.

CHAPTER PROBLEM

Points (2, 4), (3, 4) and (5, 4) share what position feature?

They all have height four and lie on the same horizontal line.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 What point is five right and two down from (1, 4)?	(6, 2). Add five to x and subtract two from y.
02 Where are all points whose second coordinate is 2?	On the horizontal line two units above the origin.
03 From (5, 2), move two left and three up. Where do you stop?	The horizontal coordinate falls from five to three and the vertical coordinate rises from two to five. The endpoint is (3, 5).
04 A is (2,2) and B is (2,7). How far apart are they?	The horizontal coordinates agree. Seven minus two gives five vertical units.
05 Find a point four right and one down from (1,6).	Add four to x and subtract one from y: (5,5).

Input	1	2	3
Output	3	5	7

Which rule doubles then adds one?

Output = 2 × input + 1. Input 6 gives 13.

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