

Grade 5 - Graphing on the Coordinate Plane - Lesson

Common Core 5.G.A.1, 5.G.A.2 · maths-pdf.fr/en/

The coordinate plane has two number lines that meet at right angles at the origin (0, 0). An ordered pair (x, y) names a point: start at the origin, move x units right along the x-axis, then y units up. In the first quadrant, both numbers are zero or greater. The order of the numbers matters.

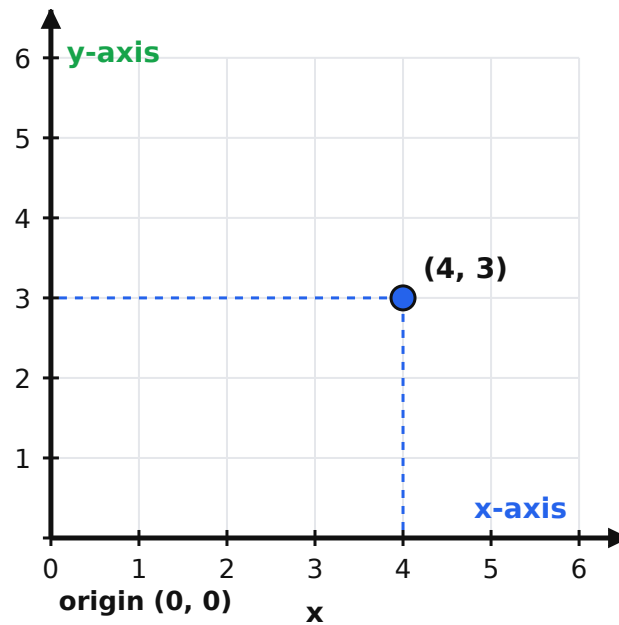
Grade 5 · Common Core State Standards: **5.G.A.1, 5.G.A.2**

Key facts

- The x-axis is horizontal and the y-axis is vertical; they meet at the origin (0, 0).
- An ordered pair (x, y) gives the move right first, then up.
- (2, 5) and (5, 2) are two different points.
- Points with the same x-coordinate or the same y-coordinate lie on a straight line, so subtract to find the distance.
- Axis labels explain what each coordinate means in a real-world graph.

What is the coordinate plane?

The coordinate plane is made from two number lines that cross at a right angle. The horizontal line is the **x-axis**. The vertical line is the **y-axis**. They meet at the **origin**, which is the point 0 on both lines. In Grade 5 we use the first quadrant, where all numbers are zero or greater. Think of a city map: the x-axis is a street running east and west, and the y-axis is an avenue running north and south. Every spot on the map can be named with two numbers.



The point $(4,3)$: 4 units right, then 3 units up.

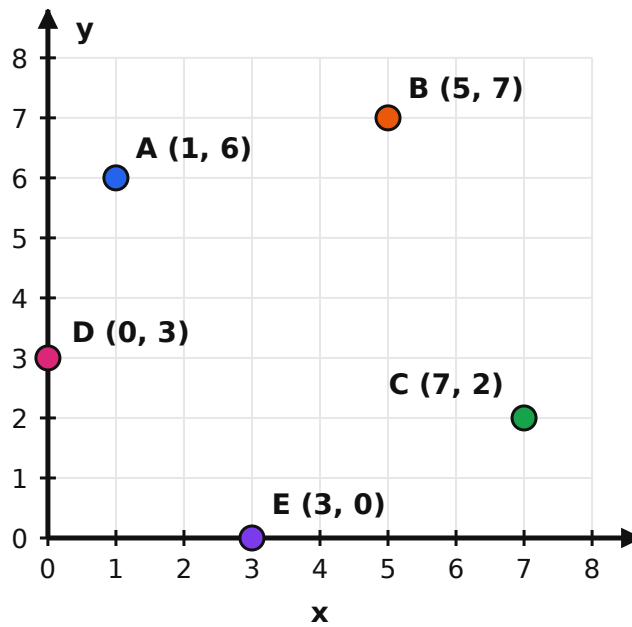
Vocabulary

Ordered pair: two numbers written (x,y) that name a point. **x-coordinate:** how far to move right. **y-coordinate:** how far to move up.

How do you plot an ordered pair?

1. Start at the origin $(0,0)$.
2. Move right along the x-axis by the first number.
3. Move up by the second number.
4. Draw a dot and label it.

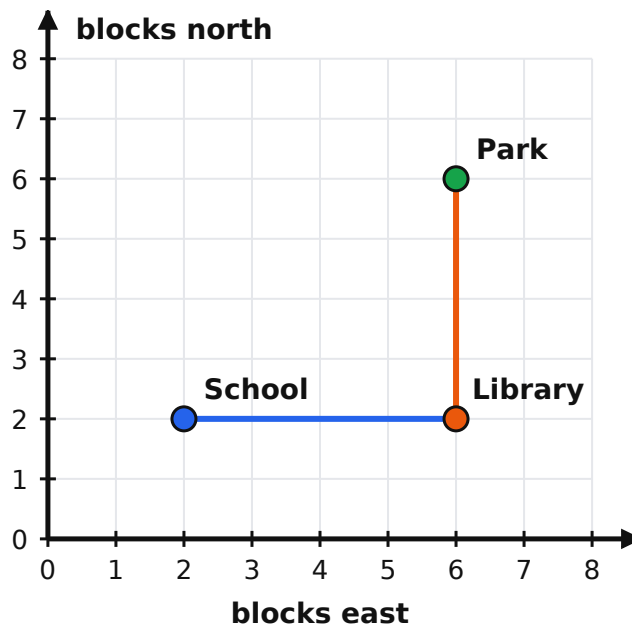
The order matters. The point $(2,5)$ is not the same as $(5,2)$. A point with y-coordinate 0 sits on the x-axis, and a point with x-coordinate 0 sits on the y-axis.



Points A and B are inside the plane. D is on the y-axis and E is on the x-axis.

How do you find the distance between two points?

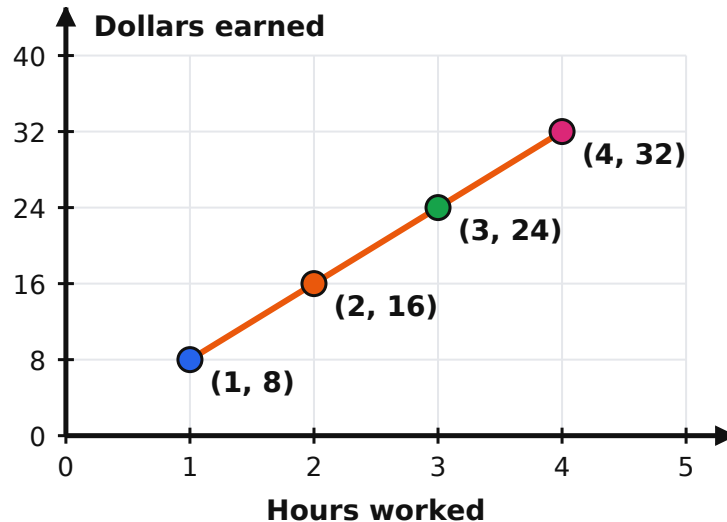
When two points have the same y-coordinate, they lie on a horizontal line. Subtract the smaller x-coordinate from the larger one. When they have the same x-coordinate, subtract the y-coordinates in the same way. Counting squares on the grid gives the same answer, but subtracting is faster. For $(2,2)$ and $(6,2)$ the distance is $6-2=4$ units.



A town map. Each square is one block. School to Library is 4 blocks east.

How do graphs show real-world situations?

Each ordered pair can tell a story. If Mei earns \$8 per hour, the point $(3, 24)$ means that after 3 hours she has earned \$24. The labels on the axes tell what each number means. Points that rise by the same amount each step show a steady pattern, so you can predict the next point, such as $(5, 40)$ for 5 hours.



Each hour earns \$8. Each point is an ordered pair (hours, dollars).

Questions about graphing on the coordinate plane

What is an ordered pair?

An ordered pair is two numbers in parentheses, like $(4, 3)$. The first number tells how far to move right from the origin and the second tells how far to move up. The order matters.

What is the origin?

The origin is the point where the x-axis and y-axis cross. Its coordinates are $(0, 0)$. Every plot starts from the origin.

How do I remember which coordinate comes first?

Remember to run before you jump: move right along the x-axis first, then up the y-axis. The x-coordinate always comes first in an ordered pair.

How do I find the distance between $(1, 4)$ and $(7, 4)$?

The y-coordinates are the same, so the points are on a horizontal line. Subtract the x-coordinates: $7 - 1 = 6$ units.

What does a point on a real-world graph mean?

Each point pairs two quantities named by the axis labels. On a graph of hours and dollars, the point $(3,24)$ means 3 hours and \$24.