

Class 9 Maths Chapter 1 Orienting Yourself: The Use of Coordinates Notes Free PDF Download is prepared based on the latest CBSE and NCERT syllabus. These notes will help in school exams, board exams, and quick revision. They help students understand the chapter clearly, revise faster, and prepare for exams with confidence.

## **What Are Coordinates?**

Coordinates are a pair of numbers used to describe the exact position of a point on a flat surface. Instead of saying "the point is somewhere to the right and a bit above the centre," coordinates let you say precisely: the point is at position (3, 5). The first number tells you how far to move horizontally, and the second number tells you how far to move vertically.

## **Importance of Coordinates in Daily Life**

You already use coordinates without realising it. When you look up a location on Google Maps, the app uses latitude and longitude a coordinate system. A chess board uses letters and numbers to name each square (like E4). A cinema ticket says Row C, Seat 7. All of these are real life examples of the coordinate system in action. Chapter 1 takes this everyday idea and formalises it in mathematics.

## **Key Terms to Remember**

### **Coordinate System**

A coordinate system is a method of assigning a unique pair of numbers to every point on a plane. The most common one used in Class 9 is the Cartesian coordinate system, where two straight lines one horizontal and one vertical cross at a central point, and all positions are measured from that crossing.

### **Ordered Pair**

An ordered pair is a set of two numbers written inside brackets with a comma between them, like (x, y). The word "ordered" is important the pair (3, 5) is completely different from (5, 3). The order always follows the rule: x-coordinate first, y-coordinate second.

### **Origin**

The origin is the fixed starting point of the coordinate system. It is the point where the horizontal and vertical axes cross each other. The coordinates of the origin are always (0, 0). Every other point on the plane is measured relative to this central point.

### **X-Axis**

The x-axis is the horizontal line that runs left and right through the origin. Positive values of  $x$  are to the right of the origin, and negative values are to the left. When you read a coordinate  $(x, y)$ , the  $x$ -coordinate tells you how far along the  $x$ -axis the point sits.

### **Y-Axis**

The  $y$ -axis is the vertical line that runs up and down through the origin. Positive values of  $y$  are above the origin, and negative values are below. The  $y$ -coordinate in the pair  $(x, y)$  tells you how far up or down from the origin the point is located.

## **Important Concepts from the Chapter**

### **Locating a Point Using Coordinates**

To locate any point using its coordinates, always follow two steps in order. First, start at the origin  $(0, 0)$ . Second, move horizontally by the  $x$ -coordinate (right for positive, left for negative). Then move vertically by the  $y$ -coordinate (up for positive, down for negative). The spot where you land is your point.

For example, to locate  $(4, 3)$ : start at the origin, move 4 units to the right, then 3 units up. That is your point.

### **Reading Coordinates on a Grid**

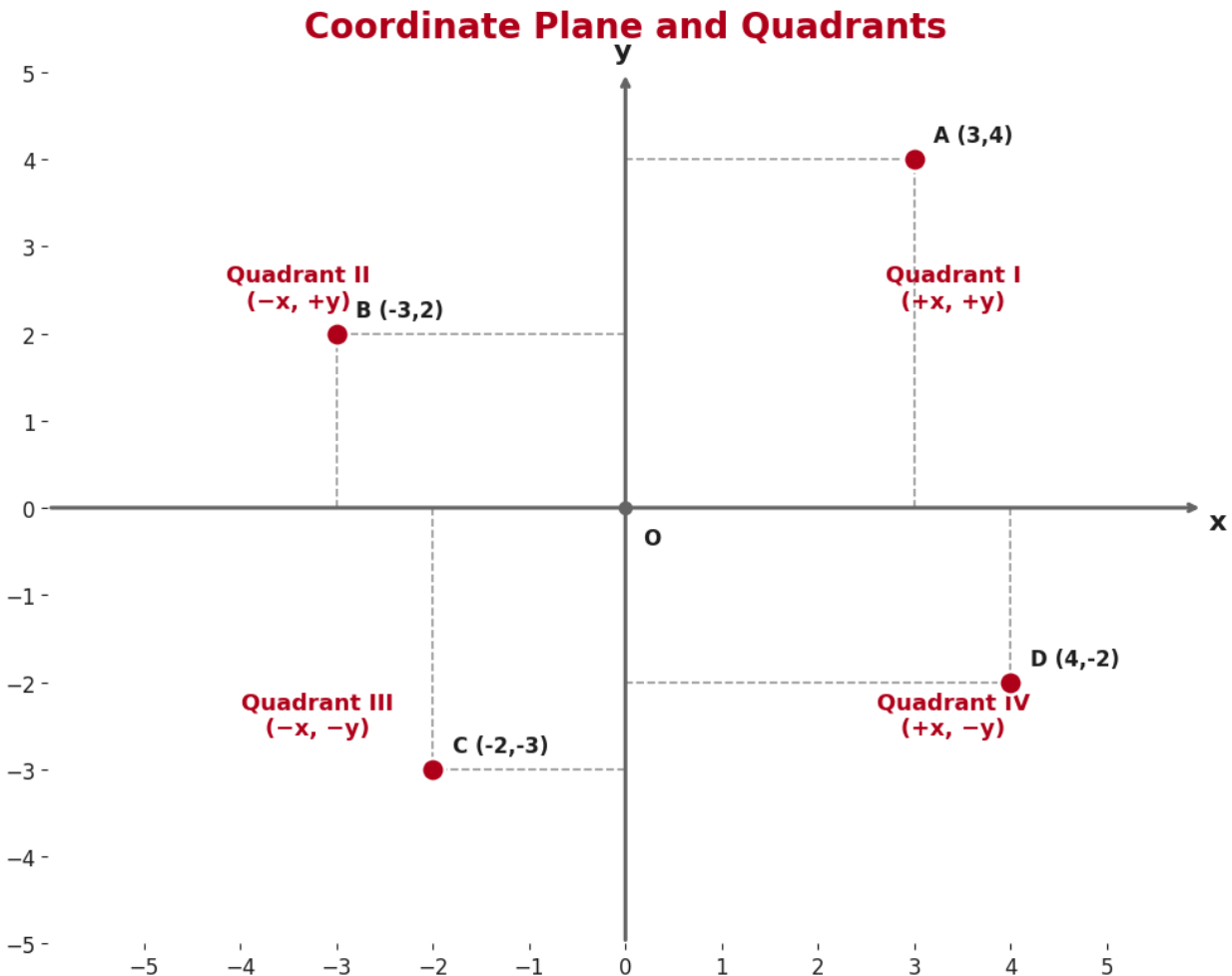
When you are given a grid with a point already marked, read the coordinates by reversing the process. Drop a vertical line from the point down to the  $x$ -axis the value where it touches is the  $x$ -coordinate. Drop a horizontal line from the point across to the  $y$ -axis the value where it touches is the  $y$ -coordinate. Write the pair as  $(x, y)$ .

### **Understanding Ordered Pairs**

The most important rule about ordered pairs is that the order cannot be swapped.  $(3, 5)$  and  $(5, 3)$  are two different points in completely different locations on the plane. The  $x$ -coordinate always comes first, and the  $y$ -coordinate always comes second. This rule applies every single time no exceptions.

## **Coordinate Plane Revision Notes**

The diagram below shows the complete coordinate plane with both axes, the origin, all four quadrants, and example points labelled with their coordinates.



### Horizontal and Vertical Axes

The coordinate plane is formed by two number lines that cross at right angles. The horizontal one is the x-axis. The vertical one is the y-axis. They divide the entire plane into four regions called quadrants. In Quadrant I, both x and y are positive. In Quadrant II, x is negative and y is positive. In Quadrant III, both are negative. In Quadrant IV, x is positive and y is negative.

### Position of Points on the Plane

Every point on the plane has exactly one ordered pair. The dashed lines in the diagram above show how to read a point: drop a line to the x-axis to read the x-coordinate, and draw a line across to the y-axis to read the y-coordinate. Notice how point A (3, 4) sits in Quadrant I, point B (-3, 2) sits in Quadrant II, point C (-2, -3) sits in Quadrant III, and point D (4, -2) sits in Quadrant IV.

## How Coordinates Help in Finding Locations

### Maps and Navigation

A city map uses a grid where columns are labelled with letters (A, B, C...) and rows with numbers (1, 2, 3...). To find a hospital on the map, the index might say it is at D-5. You go to column D and row 5, and the hospital is in that square. This is exactly how the coordinate system works the column letter acts like the x-coordinate and the row number acts like the y-coordinate.

GPS systems work on the same principle but use latitude (horizontal measurement) and longitude (vertical measurement) a global coordinate system for the entire Earth.

### Real-Life Applications of Coordinates

Coordinates appear in many everyday situations. In a cinema or theatre, your seat is described by the row and the seat number an ordered pair. In a spreadsheet like Excel, each cell has a column letter and a row number (like B7) that is a coordinate. In a video game, every character's position on screen is tracked as (x, y) coordinates that update in real time. Engineers use coordinates to draw precise maps of buildings. Pilots and sailors use coordinate grids to navigate safely. The ability to locate any position using just two numbers is one of the most powerful tools in all of mathematics.

### Important Rules to Remember

#### Writing Coordinates Correctly

Always write coordinates inside regular brackets (parentheses) with a comma between the two numbers: (x, y). Do not use square brackets. Do not reverse the numbers. Do not leave out the brackets. The format is strict and consistent: x first, y second, always.

#### Identifying the X-Coordinate

The x-coordinate is the first number in the pair. It tells you the horizontal distance from the origin. If the point is to the right of the origin, x is positive. If the point is to the left, x is negative. If the point lies exactly on the y-axis,  $x = 0$ .

#### Identifying the Y-Coordinate

The y-coordinate is the second number in the pair. It tells you the vertical distance from the origin. If the point is above the origin, y is positive. If the point is below, y is negative. If the point lies exactly on the x-axis,  $y = 0$ .

### Coordinate Representation Examples

#### Example 1: Reading a Point

A point P is plotted on a grid. A vertical line from P meets the x-axis at 4. A horizontal line from P meets the y-axis at 3. What are the coordinates of P?

Answer: The coordinates of P are (4, 3). The x-coordinate is 4 (horizontal distance), and the y-coordinate is 3 (vertical distance).

### **Example 2: Plotting a Point**

Plot the point Q (-2, 5) on the coordinate plane.

Steps: Start at the origin (0, 0). Move 2 units to the left (because  $x = -2$ ). Then move 5 units upward (because  $y = +5$ ). Mark the point and label it Q (-2, 5). It will sit in Quadrant II.

### **Example 3: Finding a Location**

A school is located at position (3, -4) on a coordinate map of a town. In which quadrant does the school sit, and what does the position tell you?

Answer:  $x = 3$  (positive) and  $y = -4$  (negative), so the school is in Quadrant IV. On the map, it is 3 units to the right of the centre and 4 units below the centre.

## **Formula and Concept Summary**

### **Ordered Pair Format**

Every point on a coordinate plane is written as (x, y) where x = horizontal distance from origin and y = vertical distance from origin.

Key rules in one place:

- Origin = (0, 0)
- Any point on the x-axis:  $y = 0$ , so it looks like (x, 0)
- Any point on the y-axis:  $x = 0$ , so it looks like (0, y)
- Quadrant I: (+, +)
- Quadrant II: (-, +)
- Quadrant III: (-, -)
- Quadrant IV: (+, -)

### **Coordinate Plane Quick Revision**

## Coordinate Geometry Basics

### Origin

Always at (0, 0)  
Where axes cross

### x-axis (horizontal)

Right = positive x  
Left = negative x

### y-axis (vertical)

Up = positive y  
Down = negative y

### Four Quadrants

QI → (+, +)  
QII → (-, +)  
QIII → (-, -)  
QIV → (+, -)

### Ordered Pair Rule

Format: (x, y)  
x always first  
(3,5) ≠ (5,3)

### On-axis Rule

On x-axis →  $y = 0$   
On y-axis →  $x = 0$   
e.g. (5,0) and (0,3)

