



STUDY COURSE MATERIAL

MATHEMATICS SESSION-2020-21 CLASS- IX

TOPIC: COORDINATE GEOMETRY

DAY-1

❖ NCERT MATERIAL

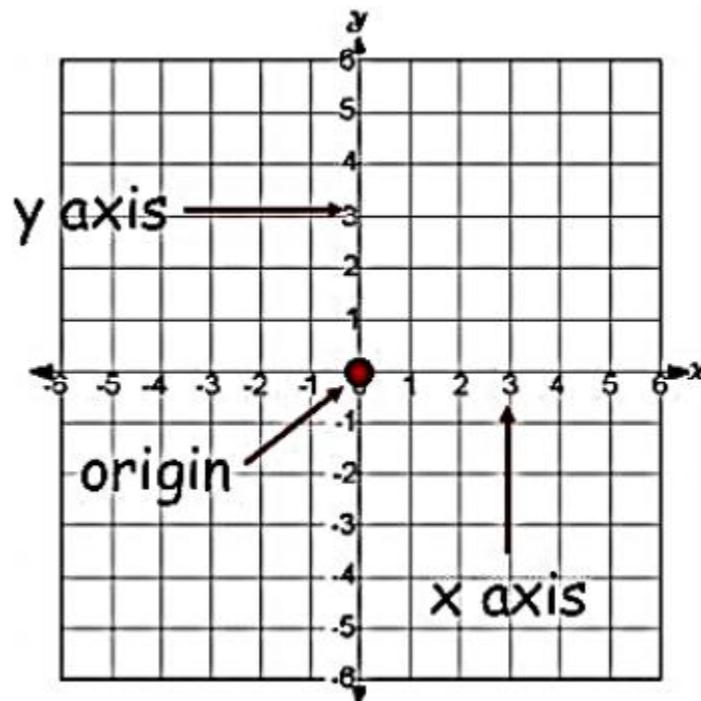
<http://ncert.nic.in/ncerts/l/iemh103.pdf>

❖ TEACHING MATERIAL

Coordinate Geometry

Cartesian System

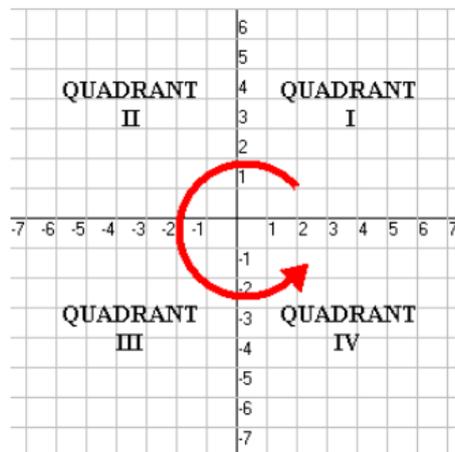
If we take two number lines, one horizontal and one vertical, and then combine them in such a way that they intersect each other at their zeroes, and then they form a **Cartesian Plane**.



- **COORDINATE AXES:** The position of a point in a plane is determined with reference to two fixed mutually perpendicular lines, called the coordinate axes.
- The horizontal line is known as **the x-axis** and the vertical line is known as the **y-axis**.
- The point where these two lines intersect each other is called the **origin**. It is represented as 'O'.
- OX and OY are the positive directions as the positive numbers lie in the right and upward direction.
- Similarly, the left and the downward directions are the negative directions as all the negative numbers lie there.

Quadrants of the Cartesian Plane

The Cartesian plane is dividing into four quadrants named as **Quadrant I, II, III, and IV** anticlockwise from OX.



❖ VIDEO-LINKS

LINK-1

<https://www.khanacademy.org/math/in-in-class-9-math-kv/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry-plotting-points-on-cartesian-plane/v/the-coordinate-plane?modal=1>

LINK-2

<https://youtu.be/LuCQAnWQO6A>

❖ PPT LINK

<https://www.slideshare.net/mobile/REVATHlg13/class-ix-maths-coordinate-geometry-ppt>

❖ DOCUMENTS LINK

<https://byjus.com/maths/coordinate-geometry-class-9/>

❖ GEO-GEBRA LINK

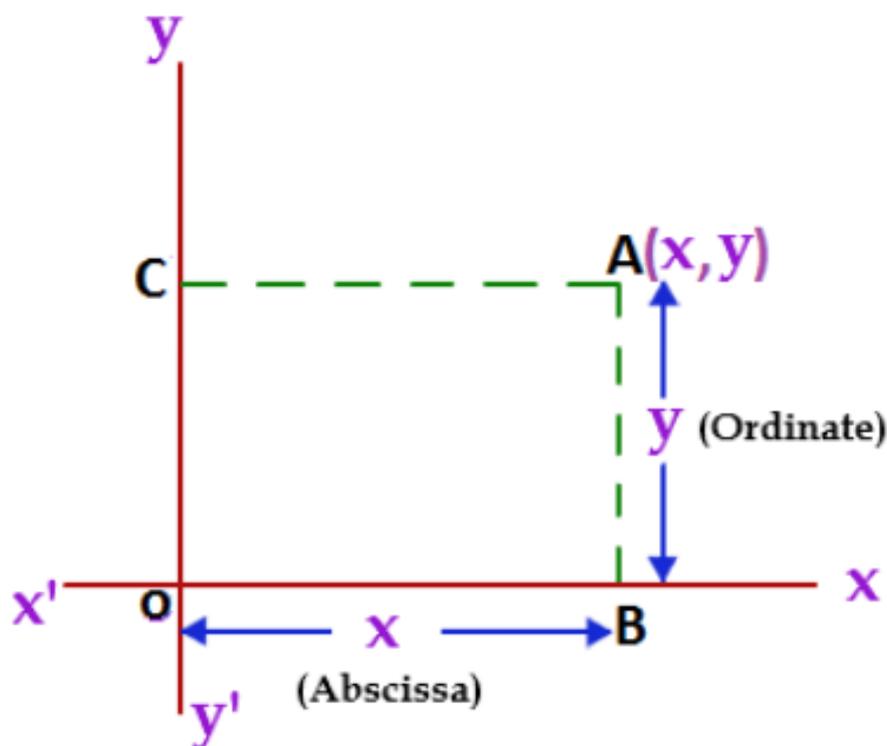
DAY-2

❖ TEACHING MATERIAL

Coordinates of a Point

To write the coordinates of a point we need to follow these rules-

- The **x - coordinate** of a point is marked by drawing perpendicular from the y-axis measured a length of the x-axis .It is also called the **Abscissa**.
- The **y - coordinate** of a point is marked by drawing a perpendicular from the x-axis measured a length of the y-axis .It is also called the **Ordinate**.
- While writing the coordinates of a point in the coordinate plane, the x - coordinate comes first, and then the y - coordinate. We write the coordinates in brackets.
- **ORDERED PAIR:** A pair of numbers 'a' and 'b' listed in a specific order with a at the first place and b at the second place is called an ordered pair (a,b).

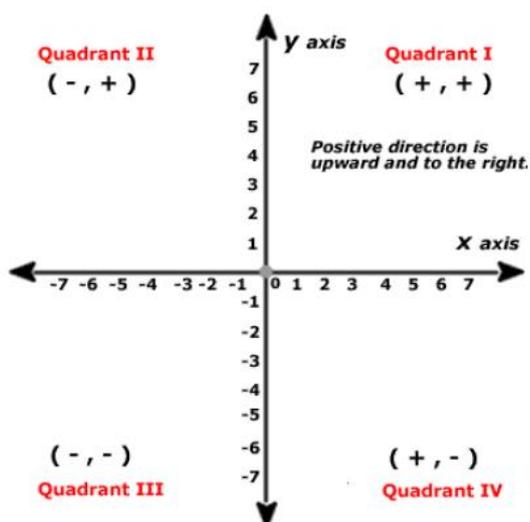


In the above figure, $OB = CA = x$ coordinate (Abscissa), and $CO = AB = y$ coordinate (Ordinate).

We write the coordinate as (x, y) .

Remark: As the origin O has zero distance from the x-axis and the y-axis so its abscissa and ordinate are zero. Hence the **coordinate of the origin is $(0, 0)$** .

The relationship between the signs of the coordinates of a point and the quadrant of a point in which it lies:



Quadrant	Coordinate	Sign in the quadrant
I	(+, +)	1st quadrant is enclosed by the positive x-axis and the positive y-axis.
II	(-, +)	2nd quadrant is enclosed by the negative x-axis and the positive y-axis.
III	(-, -)	3rd quadrant is enclosed by the negative x-axis and the negative y-axis.
IV	(+, -)	4th quadrant is enclosed by the positive x-axis and the negative y-axis.

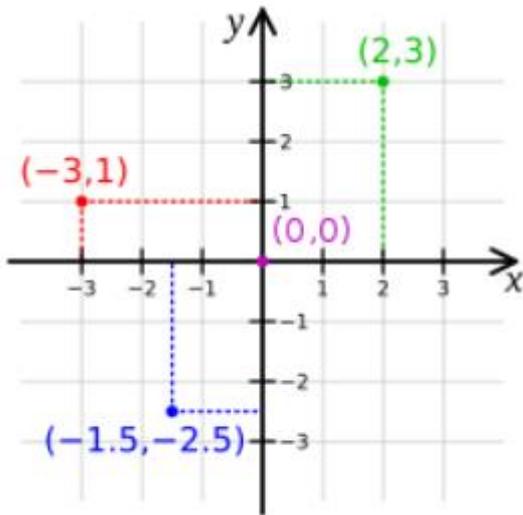
❖ VIDEO-LINK

<https://www.khanacademy.org/math/in-in-class-9-math-kv/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry-plotting-points-on-cartesian-plane/v/the-coordinate-plane?modal=1>

DAY-3

❖ TEACHING MATERIAL

Plotting a Point in the Plane if its Coordinates are Given



Steps to plot the point (2, 3) on the Cartesian plane -

- First of all, we need to draw the Cartesian plane by drawing the coordinate axes with 1 unit = 1 cm.
- To mark the x coordinates, starting from 0 moves towards the positive x-axis and count to 2.
- To mark the y coordinate, starting from 2 moves upwards in the positive direction and count to 3.
- Now this point is the coordinate (2, 3)

❖ VIDEO-LINK

MUST WATCH

<https://www.khanacademy.org/math/in-in-class-9-math-kv/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry/xab8772e5b9da7f89:in-in-9-kv-coordinate-geometry-plotting-points-on-cartesian-plane>

❖ PPT LINK

<https://www.slideshare.net/mobile/REVATHlg13/class-ix-maths-coordinate-geometry-ppt>

DAY-4

❖ TEACHING MATERIAL

POINTS ON COORDINATE AXES

- **Coordinates of a point on the x-Axis:** Every point on the x-axis is at a distance of 0 unit from the x-axis. So, its ordinate is 0.
- **Coordinates of a point on the y-Axis:** Every point on the y-axis is at a distance of 0 unit from the y-axis. So, its abscissa is 0.

Likewise, we can plot all the other points, like (-3, 1) and (-1.5, -2.5) in the right site figure.

Is the coordinates $(x, y) = (y, x)$?

Let $x = (-4)$ and $y = (-2)$

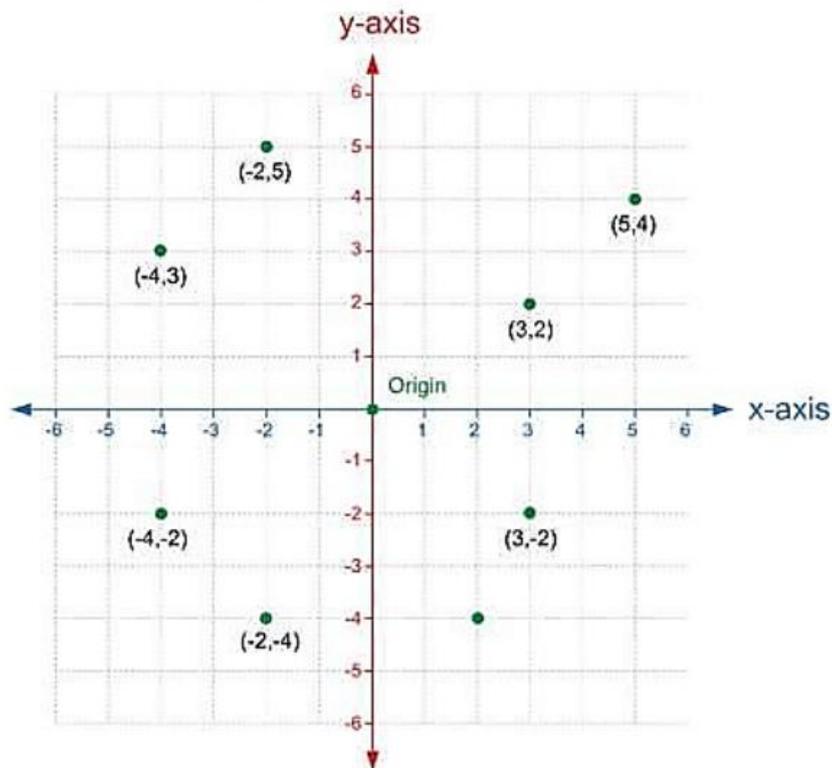
So $(x, y) = (-4, -2)$

$$(y, x) = (-2, -4)$$

Let's mark these coordinates on the Cartesian plane.

You can see that the positions of both the points are different in the Cartesian plane. So,

If $x \neq y$, then $(x, y) \neq (y, x)$, and $(x, y) = (y, x)$, if $x = y$.



Example:

Plot the points $(6, 4)$, $(-6, -4)$, $(-6, 4)$ and $(6, -4)$ on the Cartesian plane.

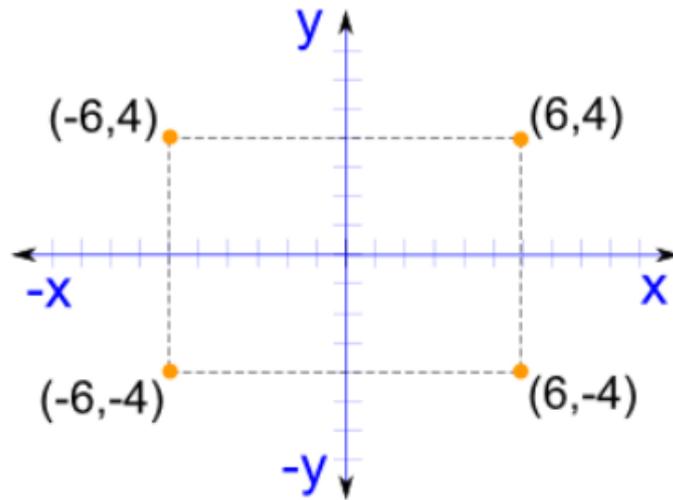
Solution:

As you can see in $(6, 4)$ both the numbers are positive so it will come in the first quadrant.

For x coordinate, we will move towards the right and count to 6.

Then from that point go upward and count to 4.

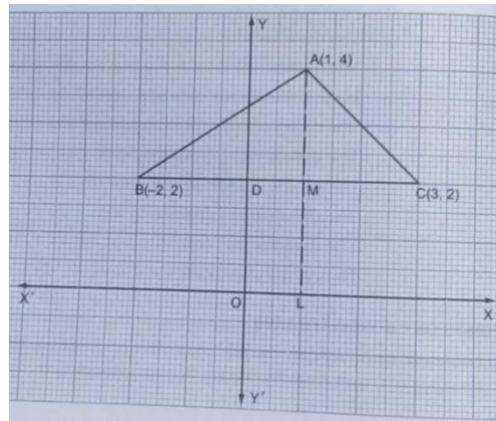
Mark that point as the coordinate $(6, 4)$.



EXAMPLE: The three vertices of a ΔABC are $A(1,4)$, $B(-2,2)$ and $C(3,2)$. Plot these points on a graph paper and calculate the area of ΔABC .

SOLUTION: Let $X'OX$ and YOY' be the x-axis and y-axis respectively, drawn on a graph paper.

Draw $AL \perp X'OX$, meeting BC at M .



$$BC = (BD + DC) = (2 + 3) \text{ units} = 5 \text{ units}$$

$$AM = (AL - LM) = (4 - 2) \text{ units} = 2 \text{ units}$$

$$\begin{aligned} \therefore \text{ar}(\Delta ABC) &= \left(\frac{1}{2} \times BC \times AM\right) \text{ sq units} \\ &= \left(\frac{1}{2} \times 5 \times 2\right) \text{ sq units} = 5 \text{ sq units.} \end{aligned}$$

❖ DOCUMENTS LINK

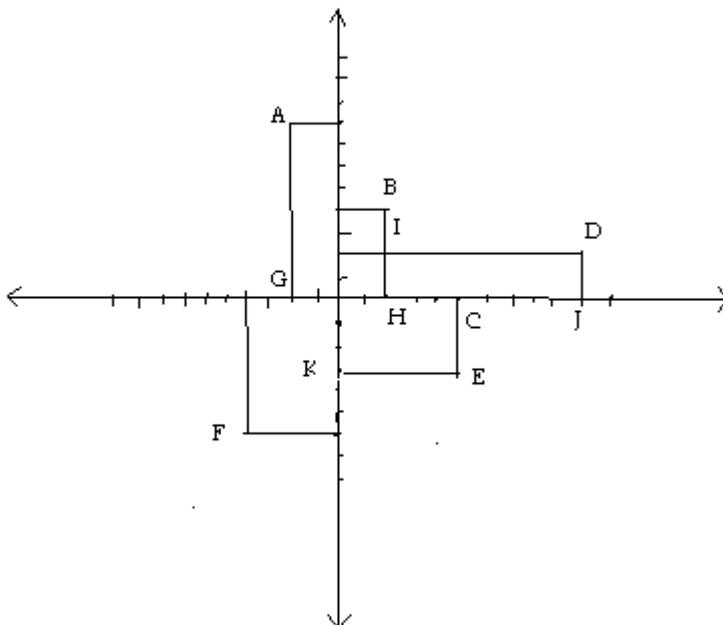
<https://byjus.com/maths/coordinate-geometry-class-9/>

❖ VIDEO-LINK

<https://youtu.be/T8XdXLkkHfw>

EXERCISE:

- Q1. Which of the following points will lie on x-axis?
- a) (-1,0) b) (4,2) c) (-3,-4) d) (0,8)
- Q2. Which point will not lie in any quadrant?
- a) (-5,3) b) (4,6) c) (0,-4) d) (-2,-4)
- Q3. The coordinates of a point lying on x-axis to the right of origin at a distance of 5 units is
- a) (0,5) b) (5,0) c) (5,5) d) None of these
- Q4. In which quadrant will the point lie, if the abscissa is -8 and ordinate is -5?
- a) 1st quadrant b) 2nd quadrant c) 3rd quadrant d) 4th quadrant
- Q5. On which axes do the following points lie?
- a) (7,0) (b) (0, -5) (c) (0,1) (d) (-4, 0)
- Q6. In which quadrant do the given points lie?
- (a) (-6, 5) (b) (-3, -2) (c) (2, -9) (d) (3, 8)
- Q7. Write down the coordinates of each of the points from A to K shown in the figure



Q8. Show the points on a graph paper:

L(0, 3), M(3, 0), N(1, 4), O(0, 6), P(-2,3), Q(-4,-3), R(0,-2), S(1,-5)

Q9. In which quadrant these points lie:

T(-1,-1), U(2,2), V(-3,4), W(5,-1), X(4,-3)

Q10. Find midpoint of (4, 0) & (-4,0).

Q11. Plot the points A (4,4), B (-4,4) and join OA, OB, and BA. What figure do you obtain?

Q12. Three vertices of a rectangle ABCD are A (3,1), B (-3,1) and C (-3,3). Plot these points on a graph paper and find the coordinates of the fourth vertex D. Also, find the area of rectangle ABCD.

Q13. Mark the points on the graph paper: A (2,0), B(2,2) ,C (0,2). Join OA, AB, BC and CO. Name the figure and calculate its area.

Q14. Plot the points A, B, C, D, E, F and G from the table:

POINT	A	B	C	D	E	F	G
ABSCISSA	-5	1	0	-12	7	-5	-8
ORDINATE	2	-6	14	3	0	-9	0

Answer the following:

- (i) Write the coordinates points A, B, C, D, E, F and G.
- (ii) Measure the distance between points E & G , A & F and the Origin & point C.
- (iii) Join CE and CG and find the area of the region formed by ECG.

ONLINE TEST LINK

<https://www.tcyonline.com/tests/coordinate-geometry-class-ix>