

9th Co- Ordinate Geometry

Q. what is coordinate geometry

Ans: The use of algebra to study geometric properties is called coordinate geometry. Points, lines, shapes and surfaces are represented by algebraic expressions in coordinate geometry.

It is the system of geometry where the position of points on the plane is described using an ordered pair of numbers. In coordinate geometry, points are placed on the coordinate plane. It has two scales: one running across the plane called the x-axis and y-axis. The coordinate of any point (x, y) shows that this point is located at a distance x from x-axis and a distance y from y-axis

Q. Find the equation of a line parallel to x-axis at a distance of 2 units below x axis?

Sol: Equation of the straight line parallel to x-axis is given by $y = k$, where k is constant. The required line is parallel to the x-axis and at a distance 2 unit below x-axis.

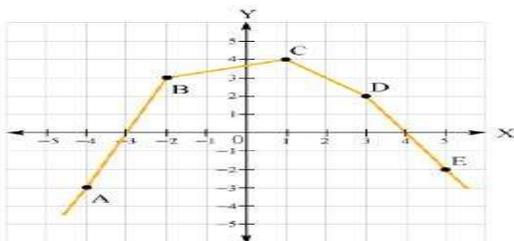
$\therefore k = -2$, Thus, the equation of required line is $y = -2$ i.e., $y + 2 = 0$

Q. what is Cartesian system?

Ans: The **Cartesian coordinate system** is used to determine each point uniquely in a plane through two numbers, usually called the x-coordinate and the y-coordinate of the point.

It is a system in which the location of a point is given by coordinates that represent its distances from perpendicular lines that intersect at a point called the **origin**. A Cartesian coordinate system in a plane has two perpendicular lines i.e., the **x-axis and y-axis**.

Q. See graph and Find what the values of x are when the value of y is zero?



Q. What do you mean by collinear and non collinear points?

Ans: Points that lie on the same line are called **collinear points**. If there is no line on which all of the points lie, then they are **non collinear points**.

Q. in which quadrant can a point have:

- 1. Abscissa =its ordinate
- 2.ordinate=in magnitude to abscissa
- 3. Ordinate=and opposite of abscissa
- 4.abscissa twice that of the ordinate

Ans: Let $P(x,y)$ be the point in the coordinate plane.

- (i) Abscissa of the point is equal to its ordinate in first and third quadrant.
- (ii) Ordinate of the point is equal in magnitude to abscissa in all the quadrants.
- (iii) Ordinate of the point is equal and opposite to abscissa in second and fourth quadrant.
- (iv) Abscissa of the point is equal to twice the ordinate in first and third quadrant.

Q. what is quadrant?

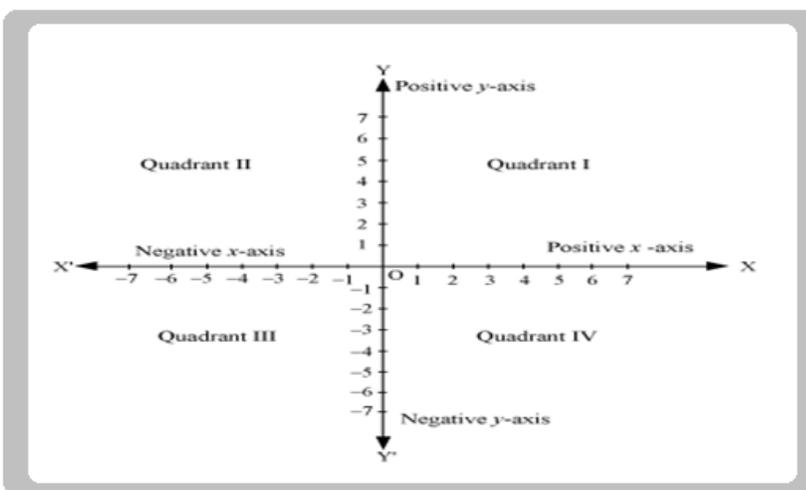
Ans: A Cartesian system consists of two perpendicular lines: one of them is horizontal and the other is vertical. The horizontal line is called the x- axis and the vertical line is called the y -axis. These are known as the coordinate axes. The x- coordinate of the point P is called the abscissa and the y- coordinate of the point P is called the ordinate.

The distance of the point from the y-axis is called it x-coordinate, or abscissa. The distance of the point from the x- axis is called it y-coordinate, or ordinate. Let the point $P(4, -3)$ on the coordinate plane. Abscissa of $P(4, -3) = 4$
Ordinate of $P(4, -3) = -3$

The coordinate axes divide the Cartesian plane into four parts which are known as quadrants.

Suppose a point $P(x, y)$ lies in the Cartesian plane.

- In the **Quadrant 1**, x is positive and y is positive.
- In the **Quadrant 2**, x is negative and y is positive.
- In the **Quadrant 3**, x is negative and y is negative.
- In the **Quadrant 4**, x is positive and y is negative.



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Q. Draw graph:- 1. $4x+y+1=0$ 2. $4x-y=0$ 3. $x+y+1=0$

Q. Determine the point on graph of the linear equation $4x - 5y = 7$ whose

- (1) Abscissa is thrice the ordinate (2) ordinate is $\frac{2}{5}$ times of abscissa

Ans:

The given equation is $4x - 5y = 7$.

(i) It is given that abscissa is thrice the ordinate

Let $(3a, a)$ be the required point.

If the point $(3a, a)$ lies on the graph of the given equation, then it will satisfy the equation.

$$4x - 5y = 7 \Rightarrow 4(3a) - 5(a) = 7 \Rightarrow 12a - 5a = 7 \Rightarrow 7a = 7 \Rightarrow a = 1$$

Thus, the required point is $(3, 1)$.

(ii) It is given that ordinate is $\frac{2}{5}$ times of abscissa.

$$\text{Let } \left(b, \frac{2}{5}b\right) \text{ be the required point. } 4x - 5y = 7 \Rightarrow 4b - 5\left(\frac{2}{5}b\right) = 7 \Rightarrow 4b - 2b = 7$$
$$\Rightarrow 2b = 7 \Rightarrow b = \frac{7}{2} \quad \text{required point is } \left(\frac{7}{2}, \frac{7}{5}\right) \text{ and } (3, 1)$$

