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COORDINATE GEOMETRY

Chapter – 3

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CLASS: 9TH
MATHEMATICS

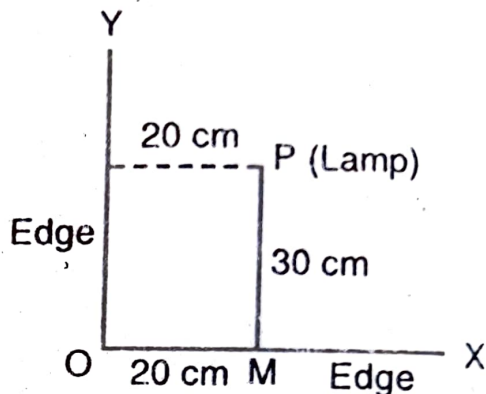
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EXERCISE 3.1

1. How will you describe the position of a table lamp on your study table to another person ?

Sol. Consider the lamp as a point P and table as a plane.

Choose any two perpendicular edges of the table, say OX and OY. Measure the distance of the lamp i.e., P from the longer edge OX, let it be 30 cm. Again, measure the distance of the lamp P from the shorter edge OY, let it be 20 cm.



Thus, the position of the lamp P referred to the edges OX and OY is (20, 30).

2. (Street Plan) : A city has two main roads which cross each other at the centre of the city. These two roads are along the North-South direction and East-West direction. All other streets of the city run parallel to these roads and are 200 m apart. There are about 5 streets in each direction. Using 1 cm = 200 m, draw a model of the city on your notebook. Represent the roads/streets by single lines.

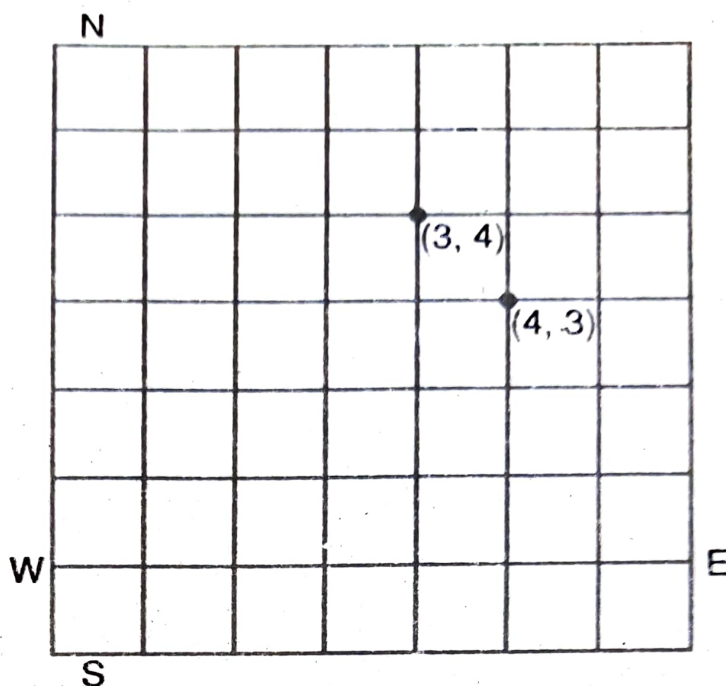
There are many cross-streets in your model. A particular cross-street is made by two streets, one running in the North-South direction and another in the East-West direction. Each cross street is referred to in the following manner : If the 2nd street running in the North-South direction and 5th in the East-West direction meet at some crossing, then we will call this cross-street (2, 5). Using this convention, find :

- (i) how many cross-streets can be referred to as (4, 3)
- (ii) how many cross-streets can be referred to as (3, 4)

Sol. Street plan is as shown in the figure :

(i) There is only one cross street, which can be referred as (4, 3).

(ii) There is only one cross street, which can be referred as (3, 4).



EXERCISE 3.2

1. Write the answer of each of the following questions :

(i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane ?

(ii) What is the name of each part of the plane formed by these two lines ?

(iii) Write the name of the point where these two lines intersect.

Sol. (i) The name of horizontal and vertical lines drawn to divide the plane into four parts is rectangular axes/coordinate axes.

(ii) The name of each part of the plane divided by axes is quadrant.

(iii) The axes intersect at the origin.

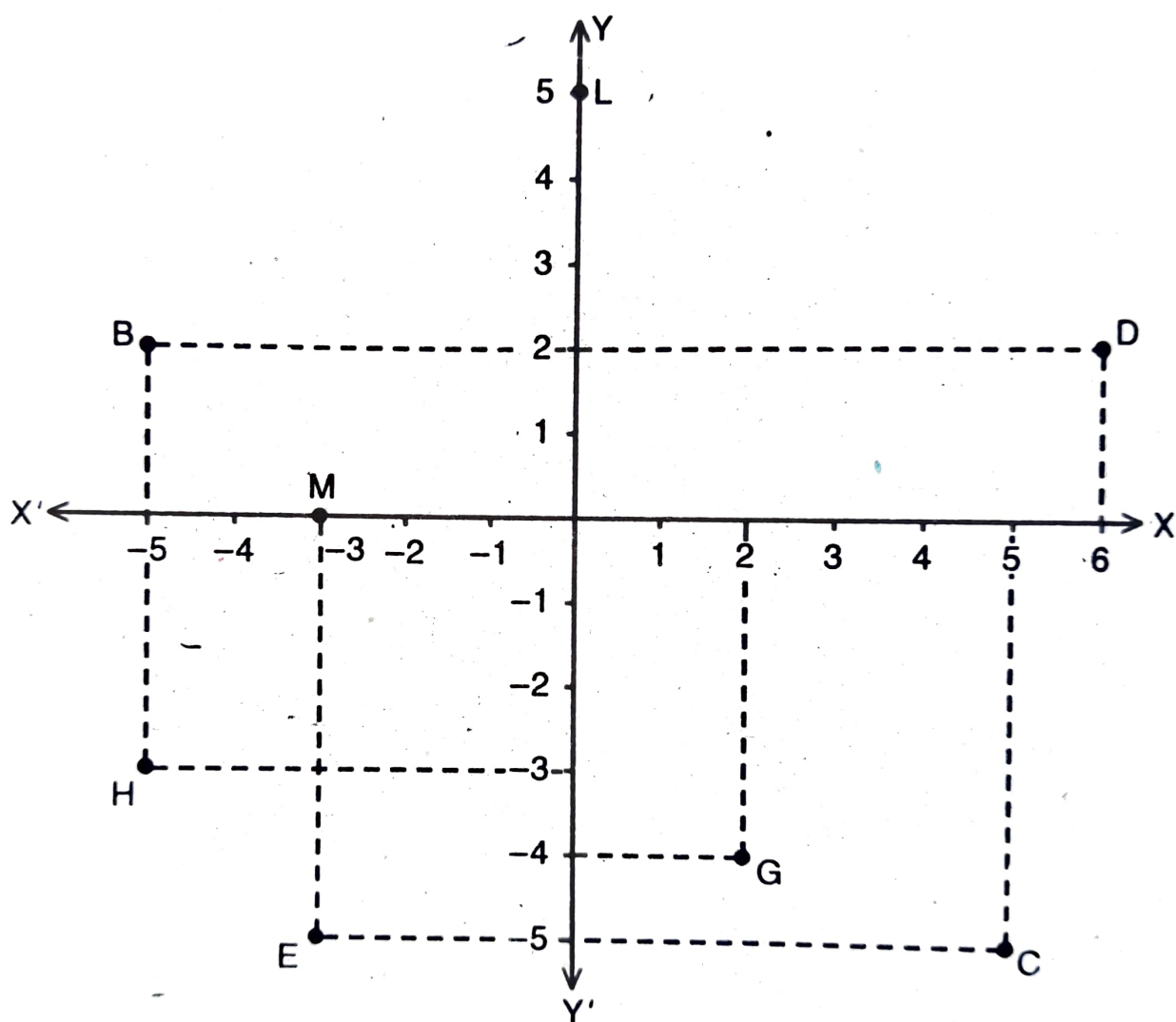
2. See figure, and write the following :

(i) The coordinates of B.

(ii) The coordinates of C.

(iii) The point identified by the coordinates $(-3, -5)$.

- (iv) The point identified by the coordinates $(2, -4)$.
- (v) The abscissa of the point D.
- (vi) The ordinate of the point H.
- (vii) The coordinates of point L.
- (viii) The coordinates of the point M.



Sol. Clearly, from the figure :

- (i) The coordinates of B are $(-5, 2)$.
- (ii) The coordinates of C are $(5, -5)$.
- (iii) The coordinates $(-3, -5)$ are identified by the point E
- (iv) The coordinates $(2, -4)$ are identified by the point G
- (v) The abscissa of the point D is 6.
- (vi) The ordinate of the point H is -3 .

(vii) The coordinates of the point L are $(0, 5)$

(viii) The coordinates of the point M are $(-3, 0)$.

EXERCISE 3.3

1. In which quadrant or on which axis do each of the points $(-2, 4)$, $(3, -1)$, $(-1, 0)$, $(1, 2)$ and $(-3, -5)$ lie? Verify your answer by locating them on the Cartesian plane.

Sol. (i) In the point $(-2, 4)$, abscissa is negative and ordinate is positive. So, it lies in the second quadrant.

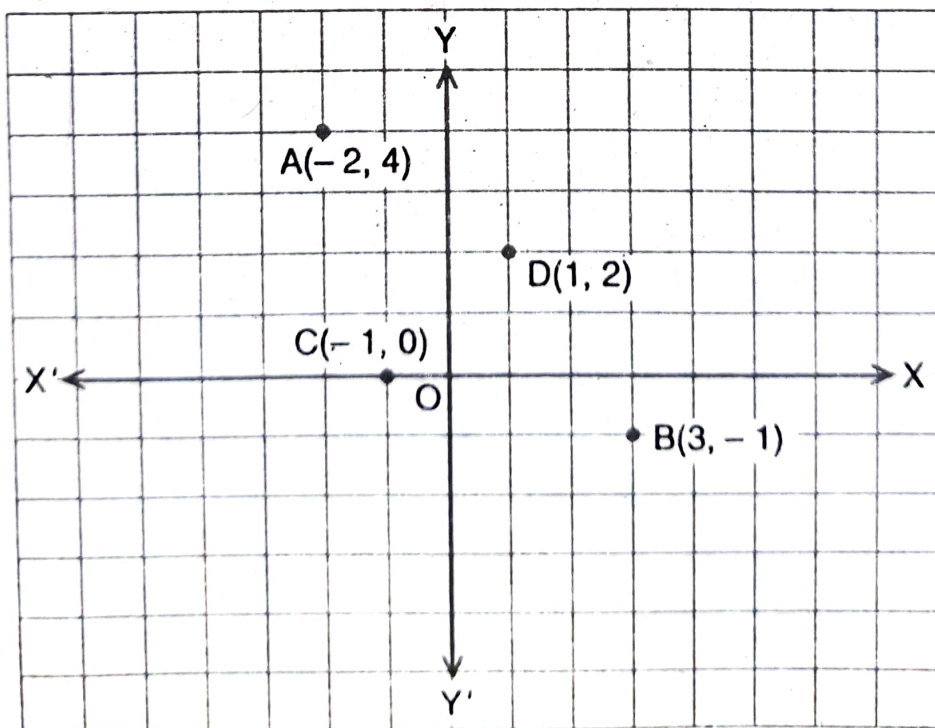
(ii) In the point $(3, -1)$, abscissa is positive and ordinate is negative. So, it lies in the fourth quadrant.

(iii) The point $(-1, 0)$ lies on the negative x -axis.

(iv) In the point $(1, 2)$ abscissa and ordinate are positive, so it lies in the first quadrant.

(v) In the point $(-3, -5)$ abscissa and ordinate are negative. Therefore, it lies in the fourth quadrant.

Let us locate these points on the cartesian plane. Plot the points $(-2, 4)$, $(3, -1)$, $(-1, 0)$ and $(1, 2)$ as shown.

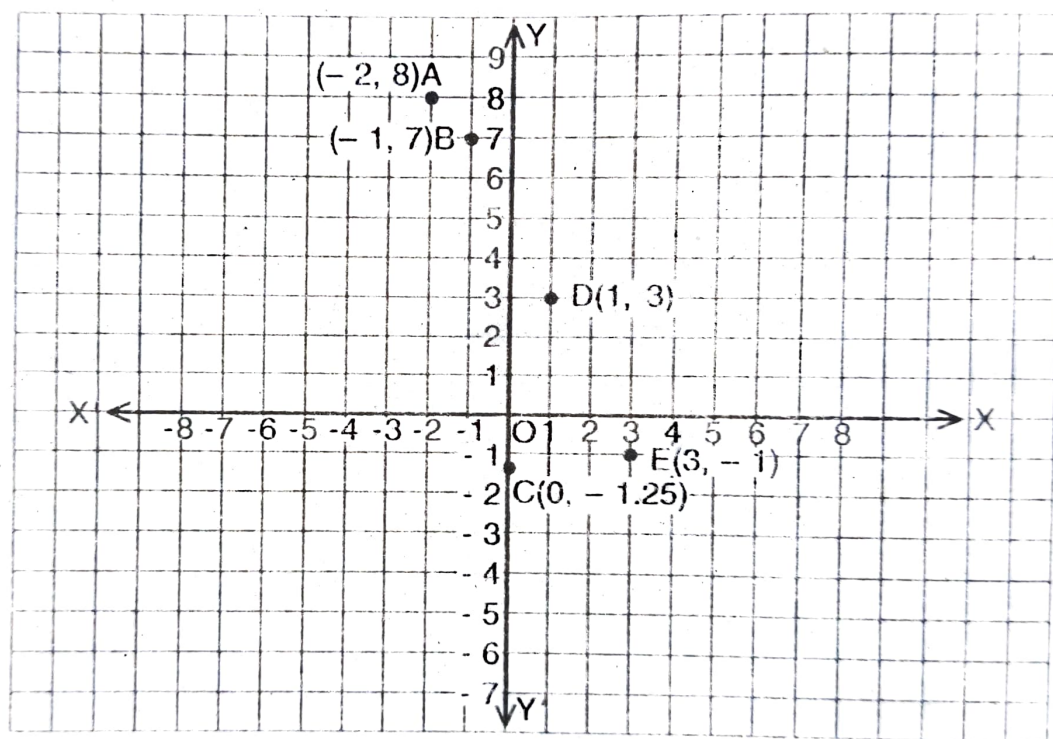


These points are respectively represented by A, B, C and D, which clearly verify their location.

2. Plot the points (x, y) given in the following table on the plane choosing suitable units of distance on the axes.

x	-2	-1	0	1	3
y	8	7	-1.25	3	-1

Sol. Draw $X'OX$ and $Y'OY$ as the coordinate axes and mark their point of intersection O as the origin $(0, 0)$.



In order to plot the point $(-2, 8)$, we take 2 units on OX' and then 8 units parallel to OY to obtain the point $A(-2, 8)$.

Similarly, we plot the point $B(-1, 7)$.

In order to plot $(0, -1.25)$, we take 1.25 units below x -axis on the y -axis to obtain $C(0, -1.25)$.

In order to plot $(1, 3)$, we take 1 unit on OX and then 3 units parallel to OY to obtain the point $D(1, 3)$.

In order to plot $(3, -1)$, we take 3 units on OX and then move 1 unit parallel to OY to obtain the point $E(3, -1)$.