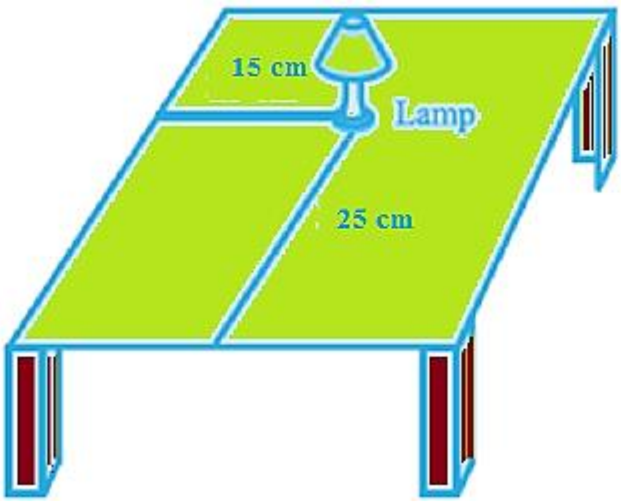
# Exercise (3.1)

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

**Solution 1:**

Let us consider the given below figure of a study stable, on which a study lamp is placed.




From the Figure Above,

- Consider the lamp on the table as a point
- Consider the table as a plane.
- We can conclude that the table is rectangular in shape, when observed from the top.
    - The table has a short edge and a long edge.
    - Let us measure the distance of the lamp from the shorter edge and the longer edge.
    - Let us assume
        - Distance of the lamp from the shorter edge is 15 cm
        - Distance of the lamp from the longer edge, its 25 cm.

Therefore, we can conclude that the position of the lamp on the table can be described in two ways depending on the order of the axes as (15, 25) or (25, 15).

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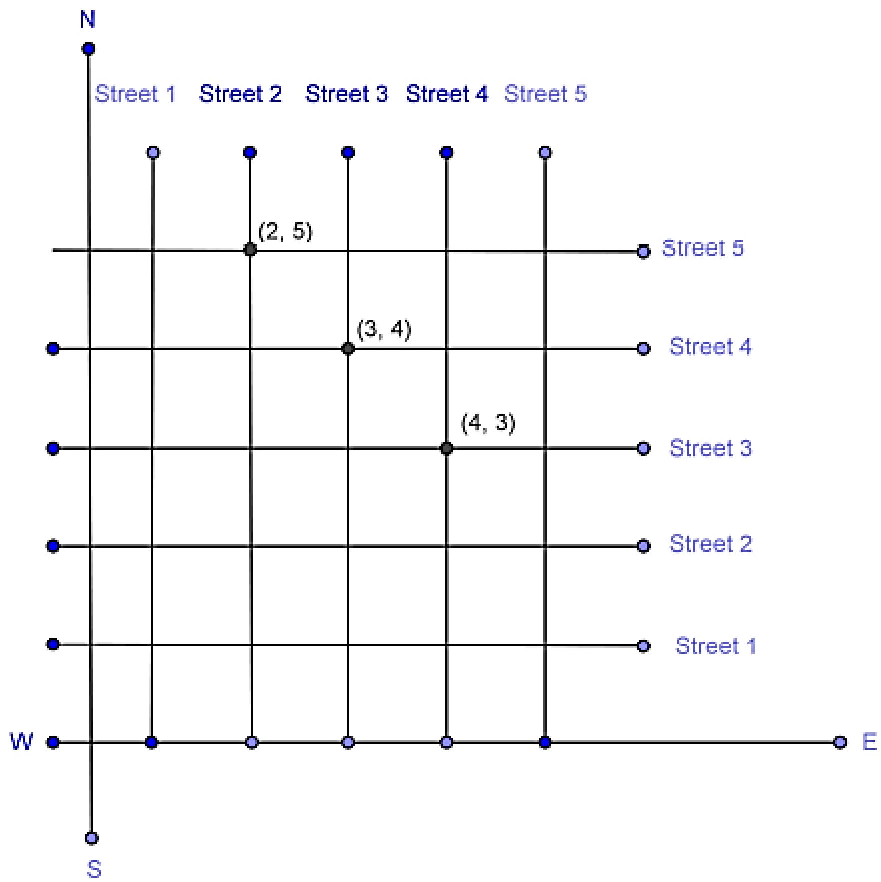
**Question 2:**
(Street Plan): A city has two main roads which cross each other at the center of the city. These two roads are along the North–South direction and East–West direction.
All the other streets of the city run parallel to these roads and are 200 m apart. There are 5 streets in each direction. 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 2$^{nd}$ 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).

**Solution 2:**

- Draw two perpendicular lines as the two main roads of the city that cross each other at the center
- Mark it as N–S and E–W.
- Let us take the scale as 1 cm = 200 m.
- Draw five streets that are parallel to both the main roads, to get the given below figure.



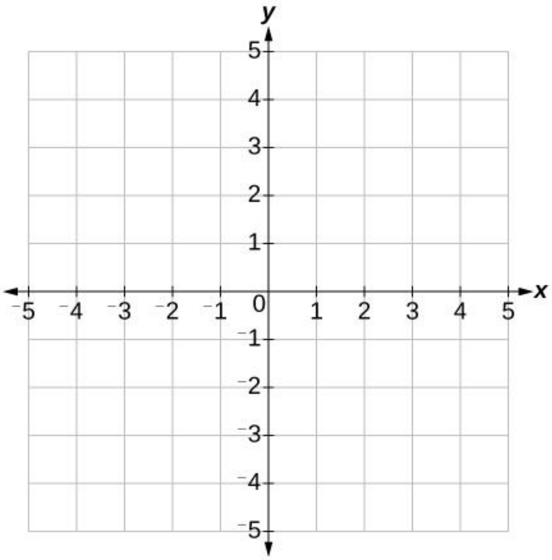

Street plan is as shown in the figure:
(i) There is only one cross street, which can be referred as (4, 3).
(ii) There is only one cross street, which can be referred as (3, 4).

# Exercise (3.2)

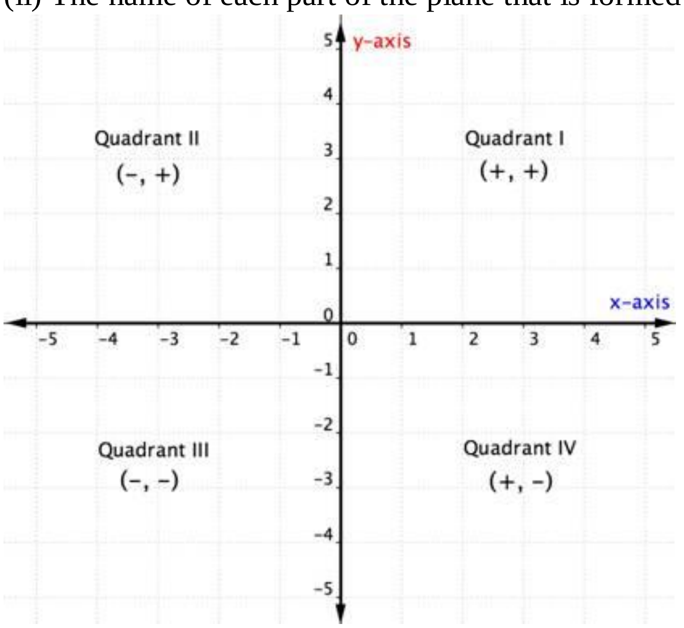
**Question 1:** Write the answer of each of the following questions:
(i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?
(ii) What is the name of each part of the plane formed by these two lines?
(iii) Write the name of the point where these two lines intersect.

**Solution 1:**
(i) The horizontal line that is drawn to determine the position of any point in the Cartesian plane is called as ***x*-axis**.

The vertical line that is drawn to determine the position of any point in the Cartesian plane is called as ***y*-axis**.




(ii) The name of each part of the plane that is formed by *x*-axis and *y*-axis is called as **quadrant**.



(iii) The point, where the *x*-axis and the *y*-axis intersect is called as **origin** (O)

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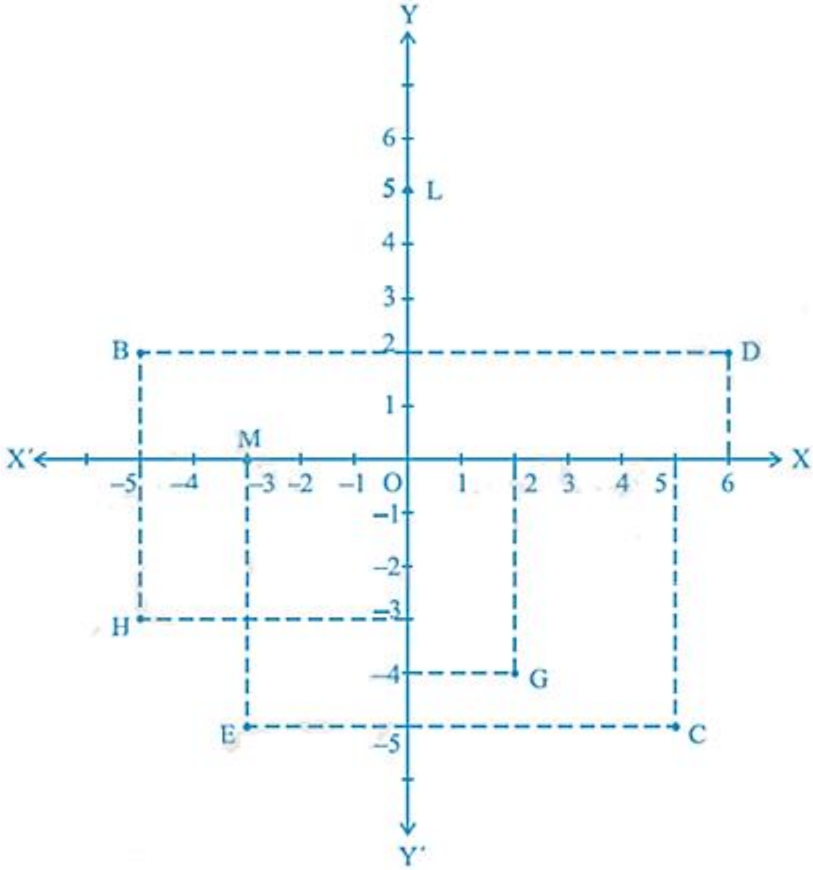
**Question 2:** See the figure, and write the following:
(i) The coordinates of B.
(ii) The coordinates of C.
(iii) The point identified by the coordinates (–3, –5).
(iv) The point identified by the coordinates (2, –4).
(v) The abscissa of the point D.
(vi) The ordinate of the point H.
(vii) The coordinates of the point L.
(viii) The coordinates of the point M.




**Solution 2:**
From the Figure above,

(i) The coordinates of point B is the distance of point B from *x*-axis and *y*-axis. Therefore, the coordinates of point B are (–5, 2).
(ii) The coordinates of point C is the distance of point C from x-axis and y-axis. Therefore, the coordinates of point C are (5, –5).
(iii) The point that represents the coordinates (–3, –5) is E.
(iv) The point that represents the coordinates (2, –4) is G.

(v) The abscissa of point D is the distance of point D from the y-axis. Therefore, the abscissa of point D is 6.

(vi) The ordinate of point H is the distance of point H from the x-axis. Therefore, the abscissa of point H is –3.

(vii) The coordinates of point L in the above figure is the distance of point L from x-axis and y-axis. Therefore, the coordinates of point L are (0, 5).

(viii) The coordinates of point M in the above figure is the distance of point M from x-axis and y-axis. Therefore the coordinates of point M are (–3, 0).

# Exercise (3.3)

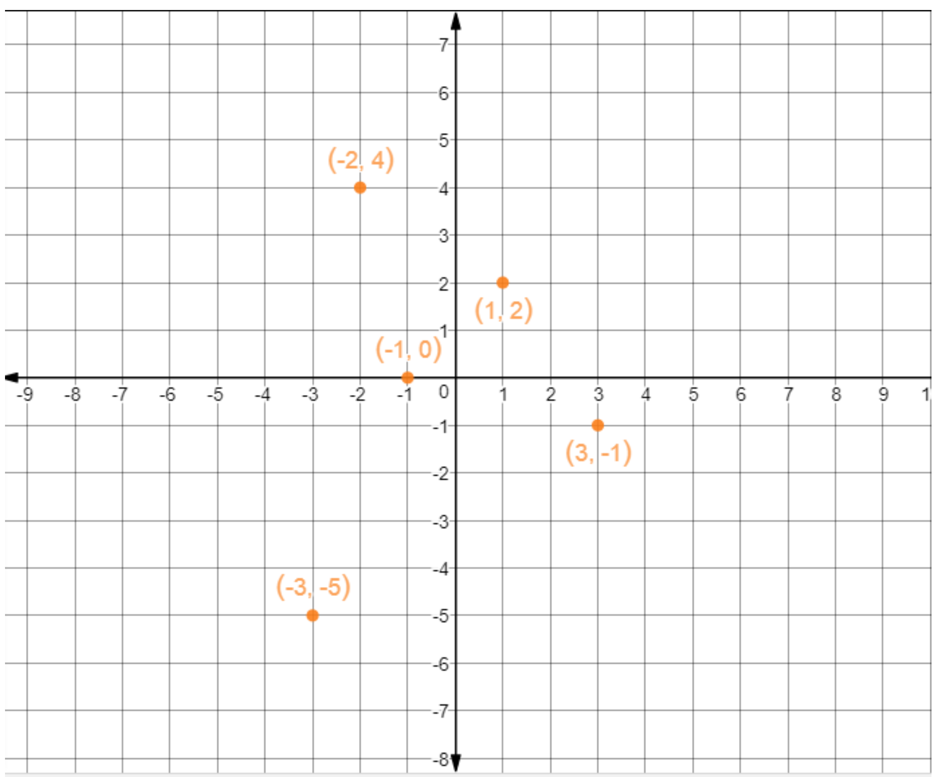
**Question 1:**

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.

**Solution 1:**

To determine the quadrant or axis of the points (–2, 4), (3, –1), (–1, 0), (1, 2) and (–3, –5).

Plot the plot the points (–2, 4), (3, –1), (–1, 0), (1, 2) and (–3, –5) on the graph, to get



From the figure above, we can conclude that the points

- Point (–2, 4) lie in II$^{nd}$ quadrant.
- Point (3, –1) lie in IV$^{th}$ quadrant.
- Point (–1, 0) lie on the negative *x*-axis.
- Point (1, 2) lie in I$^{st}$ quadrant.
- Point (–3, –5) lie in III$^{rd}$ quadrant.

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**Question 2:**

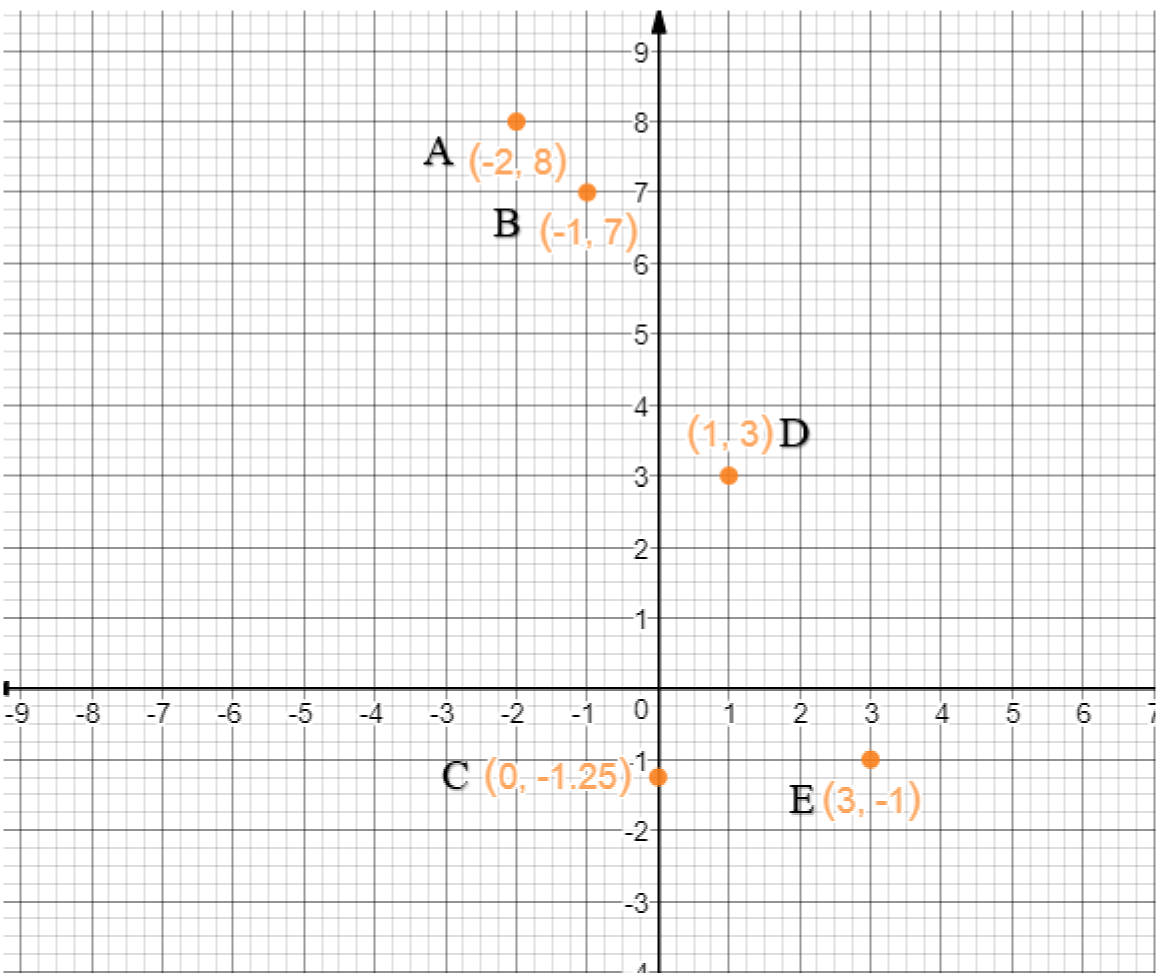
Plot the points (*x*, *y*) given in the following table on the plane, choosing suitable units of distance on the axes.

| X | –2 | –1 | 0 | 1 | 3 |
|---|---|---|---|---|---|
| y | 8 | 7 | –1.25 | 3 | –1 |

**Solution 2:**

Given,

| X | –2 | –1 | 0 | 1 | 3 |
|---|---|---|---|---|---|
| y | 8 | 7 | –1.25 | 3 | –1 |



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 table provided above,

- Point  A(–2, 8)
  - Take 2 units on OX' and then 8 units parallel to OY
- Point B (–1, 7)

  - Take -1 unit on OX' and then 7 units parallel to OY
- Point C(0, –1.25),
  - Take 1.25 units below x-axis on OY' on the y-axis
- Point D(1, 3)
  - Take 1 unit on OX and then 3 units parallel to OY
- Point E(3, –1),
  - Take 3 units on OX and then move 1 unit parallel to OY'