

Chapter 3 – Coordinate Geometry
Exercise 3.1 Multiple Choice Question (MCQ)

Question 1: Point (-3, 5) lies in the
(a) first quadrant (b) second quadrant
(c) third quadrant (d) fourth quadrant

Answer: In point (-3, 5), x-coordinate is negative and y-coordinate is positive. So, the point lies in the second quadrant.

Question 2: Signs of the abscissa and ordinate of a point in the second quadrant are respectively.

- (a) +, +**
- (b) -, -**
- (c) -, +**
- (d) +, -**

Answer: (C) In the second quadrant, X-axis is negative and Y-axis is positive. So, a sign of abscissa of a point is negative and a sign of ordinate of a point is positive.

Question 3: Point (0, - 7) lies
(a) on the X-axis (b) in the second quadrant
(c) on the Y-axis (d) in the fourth quadrant

Answer: (c) In point (0, -7) x-coordinate is zero, so it lies on Y-axis and y-coordinate is negative, so the point (0, - 7) lies on the Y-axis in the negative direction.

Question 4: Point (- 10,0) lies
(a) on the negative direction of the X-axis
(b) on the negative direction of the Y-axis
(c) in the third quadrant
(d) in the fourth quadrant

Answer: (a) In point (-10, 0) y-coordinate is zero, so it lies on X-axis and its x-coordinate is negative, so the point (-10, 0) lies on the X-axis in the negative direction.

Question 5: Abscissa of all the points on the X-axis is
(a) 0
(b) 1
(c) 2
(d) any number

Answer: (d) Abscissa of all the points on the X-axis is any number because X-axis is a number line that contains many real numbers on it.

Question 6: Ordinate of all points on the X-axis is
(a) 0
(b) 1
(c) - 1
(d) any number

Answer: (a) Ordinate of all points on the X-axis is zero. Because ordinate (or y-coordinate) of a point is the perpendicular distance of this point from the X-axis measured along the Y-axis.

If the point lies on X-axis, then the perpendicular distance of a point from the X-axis will be zero, so the ordinate will be zero.

Question 7: The point at which the two coordinate axes meet is called the (a) abscissa (b) ordinate (c) origin (d) quadrant

Answer: (c) The point at which the two coordinate axes meet is called the origin.

Question 8: A point both of whose coordinates are negative will lie in (a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

Answer: (c) A point both of whose coordinates are negative will lie in the quadrant because in III quadrant x-coordinate and y-coordinate both are negative.

Question 9: Points (1, -1), (2, -2), (4, -5) and (-3, -4)

- (a) lie in II quadrant
- (b) lie in III quadrant
- (c) lie in the IV quadrant
- (d) do not lie in the same quadrant

Answer: (d) In points (1, -1), (2, -2) and (4, -5) x-coordinate is positive and y-coordinate is negative, So, they all lie in the IV quadrant. In point (-3, -4) x-coordinate is negative and y-coordinate is negative. So, it lies in the III quadrant So, given points do not lie in the same quadrant.

Question 10: the If they-coordinate of a point is zero, then this point always lies

- (a) in I quadrant
- (b) in II quadrant
- (c) on X-axis
- (d) on Y-axis

Answer: (c) If they-coordinate of a point is zero, then this point always lies on X-axis. Because the perpendicular distance of the point from the X-axis measured along the Y-axis is zero.

Question 11: The points (-5, 2) and (2, -5) lie in the

- (a) same quadrant
- (b) II and III quadrants, respectively
- (c) II and IV quadrants, respectively
- (d) IV and II quadrants, respectively

Answer: (c) In point (-5,2), x-coordinate is negative and y-coordinate is positive, so it lies in II quadrant and point (2, -5), x-coordinate is positive and y-coordinate is negative, so it lies in IV quadrant.

Question 12: If the perpendicular distance of a point P from the X-axis is 5 units and the foot of the perpendicular lines in the negative direction of the X-axis, then the point P has

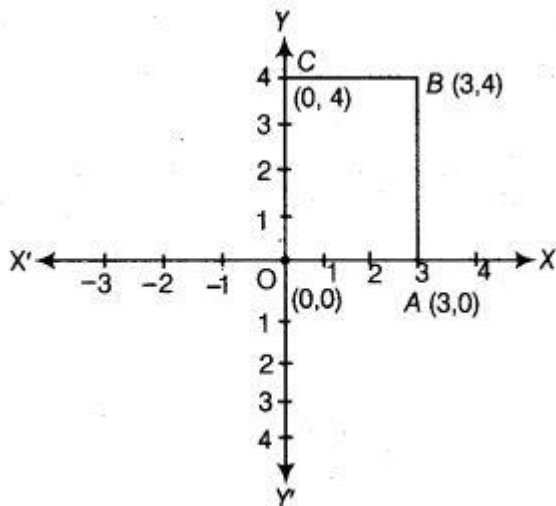
- (a) x-coordinate = -5 (b) y-coordinate = 5 only
(c) y-coordinate = -5 only (d) y-coordinate = 5 or -5

Answer: **(d)** We know that the perpendicular distance of a point from the X-axis gives the y-coordinate of that point. Here, the foot of perpendicular lies in the negative direction of the X-axis, so perpendicular distance can be measure in the II quadrant or III quadrants. Hence, point P has y-coordinate = 5 or -5.

Question 13: On plotting the points $O(0, 0)$, $A(3, 0)$, $B(3, 4)$, $C(0, 4)$ and joining OA , AB , BC and CO . Which of the following figure is obtained?

- (a) Square (b) Rectangle
(c) Trapezium (d) Rhombus

Answer: **(b)** Here, point $O(0, 0)$ is the origin. $A(3, 0)$ lies in the positive direction of the X-axis, $B(3, 4)$ lies in the 1st quadrant and $C(0, 4)$ lies in the positive direction of the Y-axis. On joining OA , AB , BC and CO the figure obtained is a rectangle.

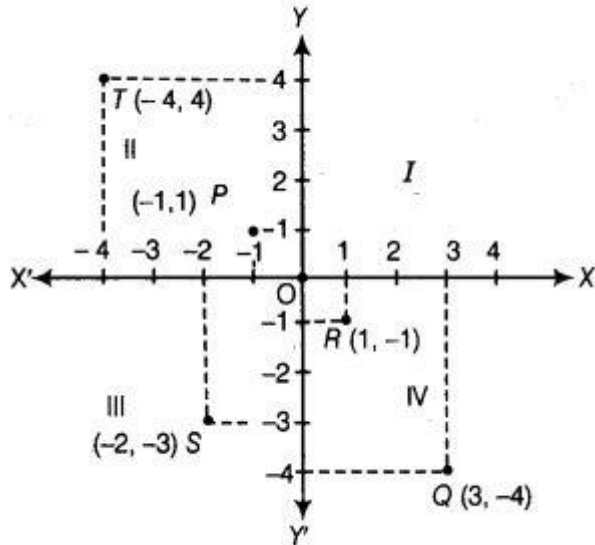


Question 14: If $P(-1, 1)$, $Q(3, -4)$, $R(1, -1)$, $S(-2, -3)$ and $T(-4, 4)$ are plotted on the graph paper, then the point(s) in the fourth quadrant is/are

- (a) P and (b) Q and R
(c) Only S (d) P and R

Answer: **(b)** In point P $(-1, 1)$, x-coordinate is -1 unit and y-coordinate is 1 unit, so it lies in the 2nd quadrant. Similarly, we can plot all the points Q $(3, -4)$, R $(1, -1)$, S $(-2, -3)$ and T $(-4, 4)$,

It is clear from the graph that points R and Q lie in the fourth quadrant.



Question 15: If the coordinates of the two points are P(-2, 3) and Q(-3, 5), then (Abscissa of P) – (Abscissa of Q) is

- (a) -5 (b) 1 (c) -1 (d) -2

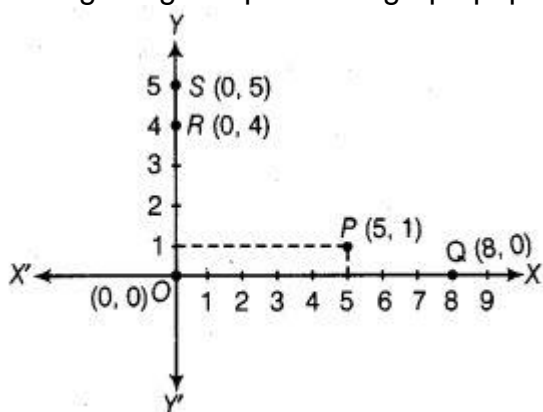
Answer: **(b)** We have, points P(-2, 3) and Q(-3, 5)

Here, abscissa of P i.e., x-coordinate of P is -2 and abscissa of Q i.e., x-coordinate of Q is -3. So, (Abscissa of P) – (Abscissa of Q) = $-2 - (-3) = -2 + 3 = 1$.

Question 16: If P(5,1), Q(8, 0), R(0, 4), S(0, 5) and O(0, 0) are plotted on the graph paper, then the points on the X-axis is/are

- (a) P and R (b) R and S (c) Only Q (d) Q and O

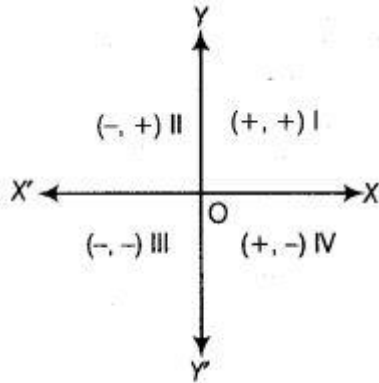
Answer: **(d)** We know that a point lies on X-axis if its y-coordinate is zero. So, on plotting the given points on graph paper, we get Q and O lie on the X-axis.



Question 17: Abscissa of a point is positive in

- (a) I and II quadrants (b) I and IV quadrants
(c) I quadrant (d) II quadrant

Answer: **(b)** Abscissa of a point is positive in I and IV quadrants.

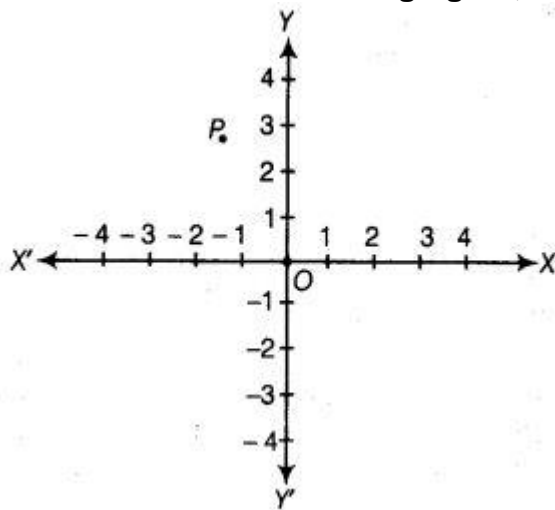


Question 18: The points whose abscissa and ordinate have different signs will lie in

- (a) I and II quadrants (b) II and III quadrants
(c) I and III quadrants (d) II and IV quadrants

Answer: **(d)** The points whose abscissa and ordinate have different signs will be of the form $(-x, y)$ or $(x, -y)$ and these points will lie in II and IV quadrants.

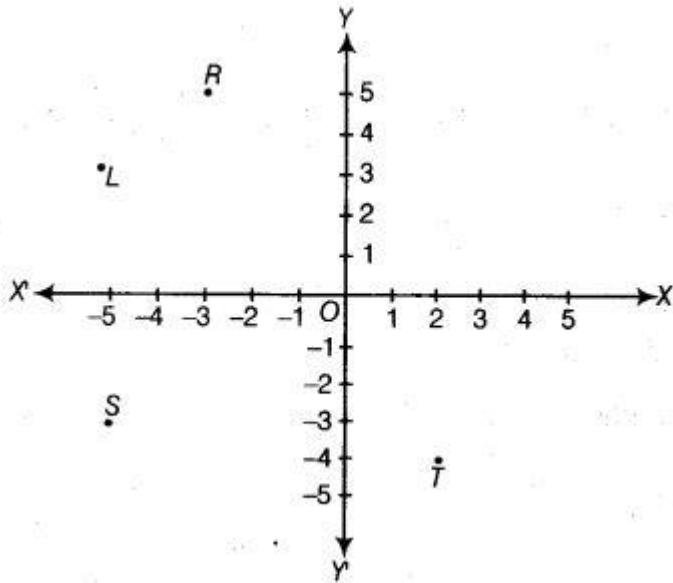
Question 19: In the following figure, coordinates of P are



- (a) $(-4, 2)$
(b) $(-2, 4)$
(c) $(4, -2)$
(d) $(2, -4)$

Answer: **(b)** Here, given point P lies in the II quadrant, so its abscissa will be negative and ordinate will be positive. Also, its perpendicular distance from X-axis is 4, so the y-coordinate of P is 4 and its perpendicular distance from Y-axis is 2, so the x-coordinate is -2. Hence, the coordinates of P are $(-2, 4)$.

Question 20: In the following figure, the point identified by the coordinates $(-5, 3)$ is



- (a) T (b) R (c) L (d) S

Answer: **(c)** In point $(-5, 3)$, x-coordinate is negative and y-coordinate is positive, so it will lie in the II quadrant. Now, we see that the perpendicular distance of L from the Y-axis is 5 and from X-axis is 3. So, the required point is L.

Question 21: The point whose ordinate is 4 and which lies on K-axis is

- (a) **(4,0)** (b) **(0,4)** (c) **(1,4)** (d) **(4,2)**

Answer: **(b)** Given ordinate of the point is 4 and the point lies on the Y-axis, so its abscissa is zero. Hence, the required point is $(0, 4)$.

Question 22: Which of the points $P(0, 3)$, $Q(1, 0)$, $R(0, -1)$, $S(-5, 0)$ and $T(1, 2)$ do not lie on the X-axis?

- (a) **P and R only** (b) **Q and S** (c) **P, R and T** (d) **Q, S and T**

Answer: **(c)** We know that, if a point is of the form $(x, 0)$ i.e., its y-coordinate is zero, then it will lie on X-axis otherwise not. Here, y-coordinates of points $P(0, 3)$, $R(0, -1)$ and $T(1, 2)$ are not zero, so these points do not lie on the X-axis.

Question 23: The point which lies on the Y-axis at a distance of 5 units in the negative direction of the Y-axis is

- (a) **(0,5)** (b) **(5,0)** (c) **(0,-5)** (d) **(-5,0)**

Answer: **(C)** Given the point lies in X-axis this shows that its x-coordinate is zero. Also, it is at a distance of 5 units in the negative direction of the X-axis, so its y-coordinate is negative.

Hence, the required point is $(0, -5)$.

Question 24: The perpendicular distance of the point $P(3, 4)$ from the Y-axis is

- (a) **3** (b) **4** (c) **5** (d) **7**

Answer: **(a)** We know that abscissa or the x-coordinate of a point is its perpendicular distance from the Y-axis. So, the perpendicular distance of the point P(3, 4) from the Y-axis
= Abscissa = 3

Exerciser 3.2

Question 1: Write whether the following statements are true or false? Justify your answer.

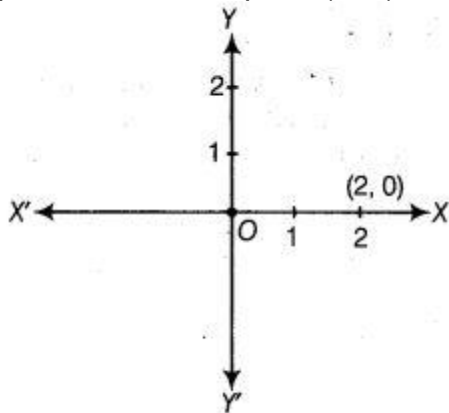
- (i)** Point (3, 0) lies in the first quadrant.
- (ii)** Points (1, -1) and (-1, 1) lie in the same quadrant.
- (iii)** The coordinates of a point whose ordinate is $-\frac{1}{2}$ and abscissa are 1 are $(-\frac{1}{2}, 1)$.
- (iv)** A point lies on Y-axis at a distance of 2 units from the X-axis. Its coordinates are (2, 0).
- (v)** (-1, 7) is a point in the second quadrant.

Answer: **(i)** False, since the ordinate of the point (3, 0) is zero. So, the point lies in X-axis.

(ii) False, because in point (1, -1) x-coordinate is positive and y-coordinate is negative, so it lies in IV quadrant and in (-1, 1), x-coordinate is negative and y-coordinate is positive, so it lies in II quadrant.

(iii) False, because stating the coordinates of a point abscissa comes first and then ordinate $(1, -\frac{1}{2})$.

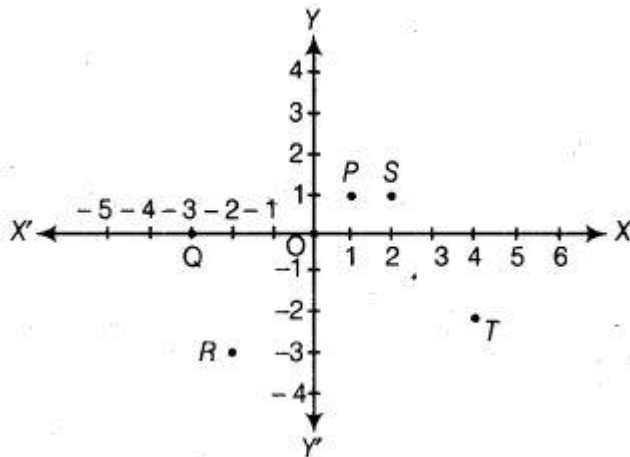
(iv) False, because point (2, 0) lies on X-axis whose distance from Y-axis is 2 units.



(v) True, because in a point (-1, 7) abscissa is negative and ordinate is positive.

Exercise 3.3

Question 1: Write the coordinates of each of the points P, Q, R, S, T and O from the figure

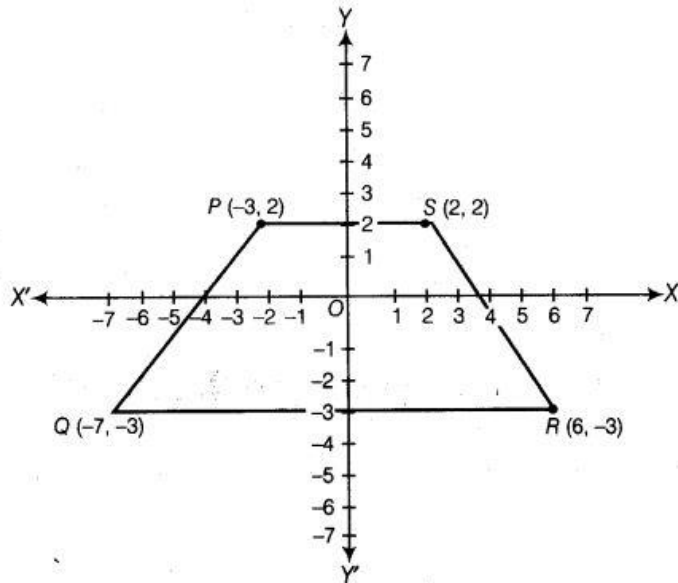


Answer: Here, points P and S lie in the I quadrant so both coordinates will be positive. Now, the perpendicular distance of P from both axes is 1, so the coordinates of P are (1, 1). Also, the perpendicular distance of S from the X-axis is 1 and from Y-axis is 2, so the coordinates of S are (2,1). Point O lies on X-axis in a negative direction so its y-coordinate will be zero and x-coordinate will be -3. So, coordinates of O are (-3 0). Point R lies in III quadrants, so both coordinates will be negative. Now, its perpendicular distance from X-axis is 3 and from Y-axis is 2, so the coordinates of point R are (-2, - 3). Point T lies in the IV quadrant, so its x-coordinate will be positive and y-coordinate will be negative. Now, the perpendicular distance from X-axis is 2 and from Y-axis is 4, so the coordinates of T are (4, -2). Point O is the intersection of both axes, so it is the origin and its coordinates are O (0,0).

Question 2: Plot the following points and write the name of the figure obtained by joining, them in order P(-3, 2), Q(-7, -3), R(6, -3)(2, 2).

Answer: Let X' OX and Y' OY be the coordinate axes and mark point on them. Here, point P(-3,2) lies in the II quadrant, Q(-7,-3) lies in the III quadrants, R(6, - 3) lies in the IV quadrant and S(2,2) lies in the I quadrant. Plotting the points on the graph

paper, the figure obtained is trapezium PQRS.

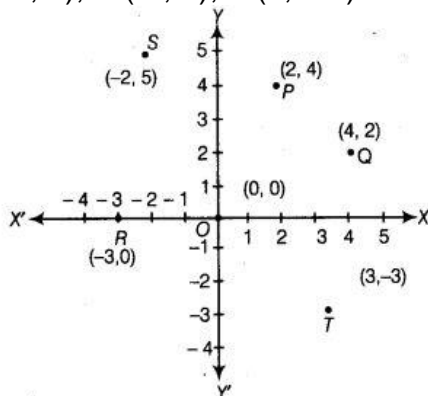


Question 3:

Plot the points (x, y) given by the following table.

x	2	4	-3	-2	3	0
y	4	2	0	5	-3	0

Answer: On plotting the given points on the graph, we get the points P(2,4), Q(4,2) R(-3, 0), S (-2, 5), T (3, -3) and O (0, 0)



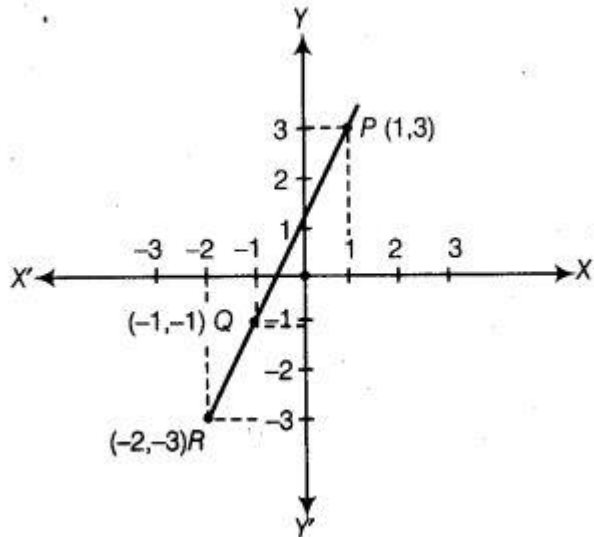
Question 4: Plot the following points and check whether they are collinear or not

- (i) $(3, -1), (-2, -3)$
- (ii) $(1, 1), (2, -3), (-2, -2)$
- (iii) $(0, 0), (2, 2), (5, 5)$

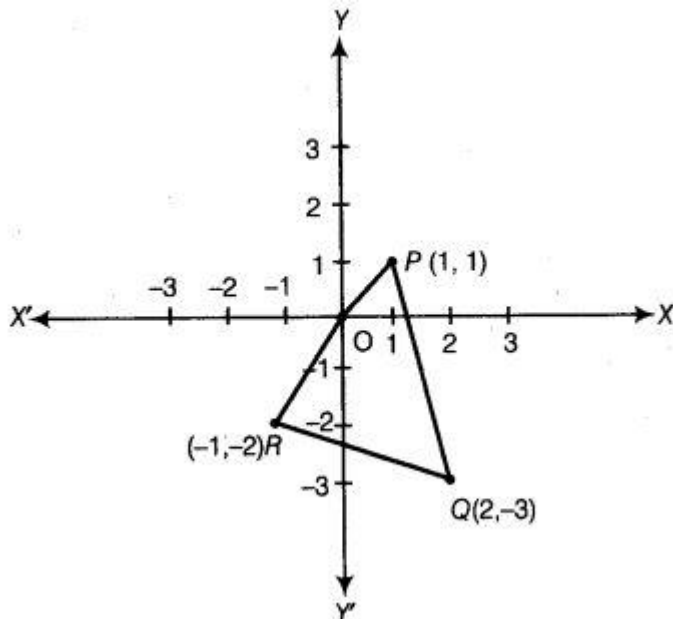
Thinking Process

- (i) Firstly, plot all three points on graph paper and join them.
- (ii) If it lies a straight line, then points are collinear otherwise non-collinear.

Answer: STEP 1: Plotting the points P (1, 3), Q (-1, -1) and R (-2, -3) on the graph paper and join these points, we get a straight line. Hence, these points are collinear.

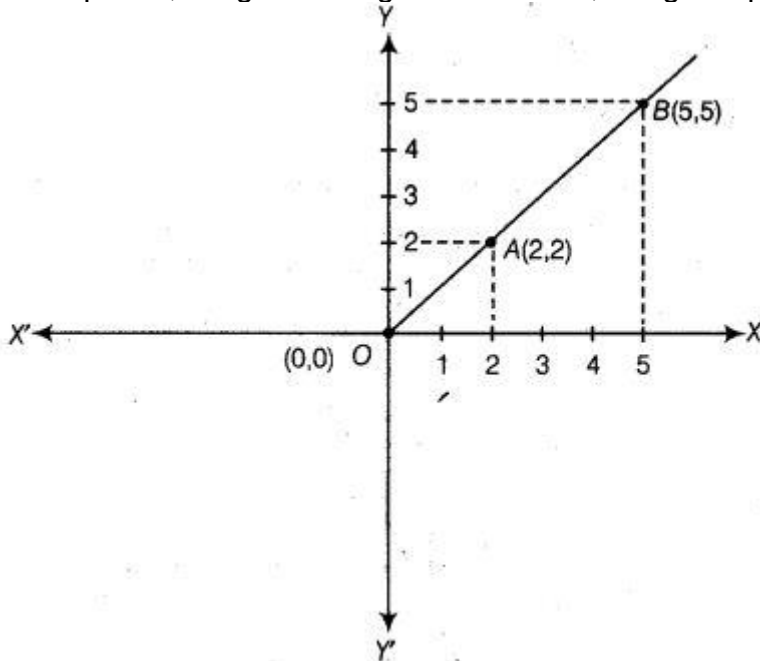


STEP 2: Plotting the points P (1,1), Q (2, -3) and R (-1, -2) on the graph paper and join these three points, we get three lines i.e., the given points do not lie on the same line. So, the given points are not collinear.



STEP 3 Plotting the points O (0, 0), A (2,2) and B (5, 5) on the graph paper and join

these points, we get a straight line. Hence, the given points are collinear.



Question 5: Without plotting the points indicate the quadrant in which they will lie, if

- (i) the ordinate is 5 and abscissa is -3 .
- (ii) the abscissa is -5 and ordinate is -3 .
- (iii) the abscissa is -5 and ordinate is 3.
- (iv) the ordinate is 5 and abscissa is 3.

Thinking Process

- (i) Firstly, write the given coordinates in a point form and check the sign of each coordinate of a point.
- (ii) Signs of the coordinates of a point in the first quadrant are $(+, +)$ in the second quadrant $(-, +)$, in the third quadrant and the fourth quadrant $(+, -)$.

Answer: **(i)** The given point is $(-3, 5)$. Here, the abscissa is negative and ordinate is positive, so it lies in the II quadrant.

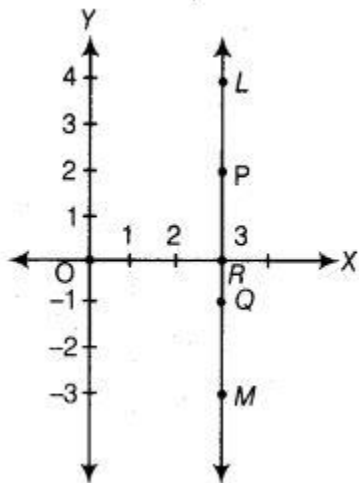
(ii) The given point is $(-5, -3)$. Here, abscissa and ordinate both are negative, so it lies in III quadrants.

(iii) The given point is $(-5, 3)$. Here, the abscissa is negative and ordinate is positive, so it lies in the II quadrant.

(iv) The given point is $(3, 5)$. Here, abscissa and ordinate both are positive, so it lies in the I quadrant.

Question 6: In figure LM is a line parallel to the Y-axis at a distance of 3 units.

- (i) What are the coordinates of the points P, R and Q?
- (ii) What is the difference between the abscissa of the points L and M?



Answer: Given, LM is a line parallel to the Y-axis and its perpendicular distance from Y-axis is 3 units.

(i) Coordinate of point P = (3, 2) [since, its perpendicular distance from X-axis is 2]
 Coordinate of point Q = (3, -1) [since, its perpendicular distance from X-axis is 1 in negative direction of Y-axis]. Coordinate of point R = (3, 0) [since its lies on X-axis, so its y-coordinate is zero].

(ii) Abscissa of point L = 3, abscissa of point M = 3

Difference between the abscissa of the points L and M = $3 - 3 = 0$

Question 7: In which quadrant or on which axis each of the following points lies?

(-3, 5), (4,-1), (2,0), (2, 2), (-3,-6)

Answer: (i) In point (-3, 5), x-coordinate is negative and y-coordinate is positive, so it lies in II quadrant.

(ii) In point (4,-1), x-coordinate is positive and y-coordinate is negative, so it lies in the IV quadrant.

(iii) In point (2,0), x-coordinate is positive and y-coordinate is zero, so it lies on X-axis.

(iv) In point (2,2), x-coordinate and y-coordinate both are positive, so it lies in the I quadrant.

(v) In point (-3, -6), x-coordinate and y-coordinate both are negative, so it lies in III quadrant.

Question 8: Which of the following points lies on the Y-axis?

A(1, 1), B(1, 0), C(0, 1), D(0, 0), E(0, -1), F(-1, 0), G(0, 5), H(-7, 0) and I(3, 3).

Thinking Process

The point lies in Y-axis means the x-coordinate of the point will be zero. Check this condition for every given point and find out the correct point.

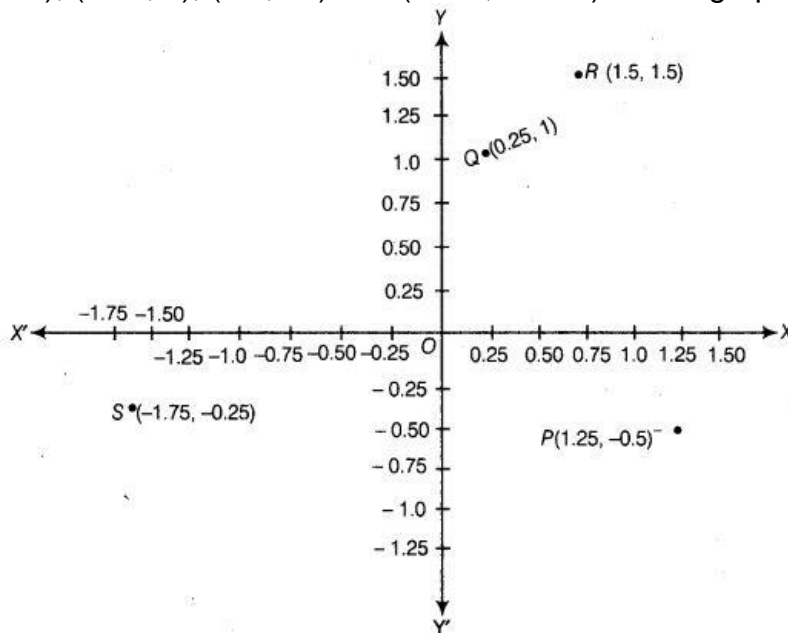
Answer: We know that a point lies on the Y-axis if its x-coordinate is zero. Here, x-coordinate of points C(0, 1), D(0, 0), E(0,-1) and G(0, 5) are zero. So, these points lie on Y-axis. Also, D(0, 0) is the intersection point of both the axes, so we can consider that it lies on Y-axis as well as on X-axis.

Question 9:

Plot the points (x, y) given by the following table. Use scale $1 \text{ cm} = 0.25 \text{ unit}$.

x	1.25	0.25	1.5	-1.75
y	-0.5	1	1.5	-0.25

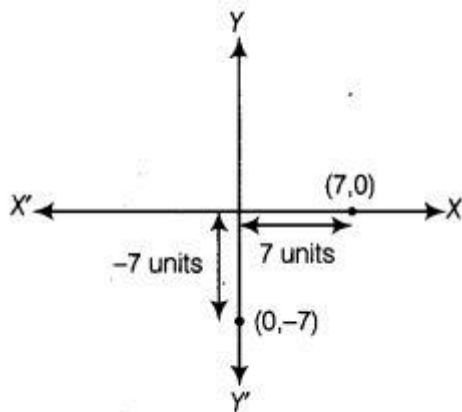
Answer: Let $X'OX$ and $Y'OY$ be the coordinate axes. Plot the given points $(1.25, -0.5)$, $(0.25, 1)$, $(1.5, 1.5)$ and $(-1.75, -0.25)$ on the graph paper.



Question 10: A point lies in the positive direction of the X-axis at a distance of 7 units from the Y-axis. What are its coordinates? What will be the coordinates, if it lies in the negative direction of the Y-axis at a distance of 7 units from the X-axis?

Answer: Given, the point lies in the positive direction of the X-axis, so its y-coordinate will be zero and it is at a distance of 7 units from the X-axis, so its coordinates are $(7, 0)$. If it lies in the negative direction of the X-axis, then its x-coordinate will be zero and its distance from X-axis is 7 units, so its coordinates are

(0, -7).



Question 11: Find the coordinates of the point

- (i) which lies on X and Y-axes both.
- (ii) whose ordinate is -4 and which lies on Y-axis.
- (iii) whose abscissa is 5 and which lies on X-axis.

Answer: **(i)** The point which lies on X and Y-axes both is origin whose coordinates are $(0, 0)$.

(ii) The point whose ordinate is -4 and which lies on Y-axis, i.e., whose x-coordinate is zero, is $(0, -4)$.

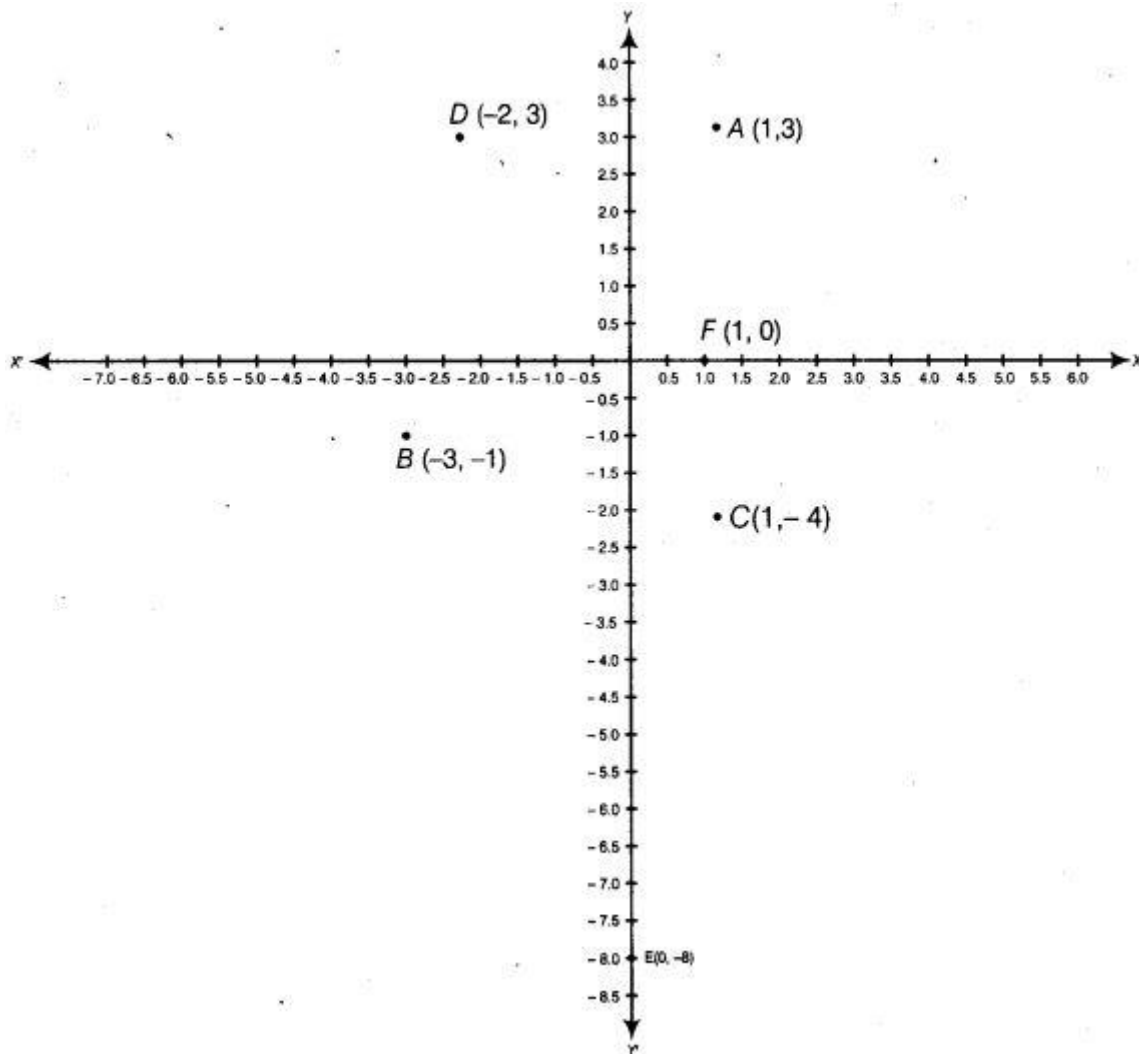
(iii) The point whose abscissa is 5 and which lies on X-axis, i.e., whose y-coordinate is zero, is $(5, 0)$.

Question 12: Taking 0.5 cm as 1 unit, plot the following points on the graph paper A $(1, 3)$, B $(-3, -1)$, C $(1, -4)$, D $(-2, 3)$, E $(0, -8)$ and F $(1, 0)$.

Answer: Here, in point A $(1, 3)$ both x and y-coordinates are positive, so it lies in the I quadrant. In point B $(-3, -1)$, both x and y-coordinates are negative, so it lies in III quadrants. In point C $(1, -4)$, the x-coordinate is positive and they-coordinate is negative, so it lies in the IV quadrant.

In point D $(-2, 3)$, the x-coordinate is negative and they-coordinate is positive, so it lies in the II quadrant.

In point E $(0, -8)$ x-coordinate is zero, so it lies on Y-axis and in point F $(1, 0)$ y-coordinate is zero, so it lies on X-axis.



On plotting the given points, we get the following graph.

Exercise 3.4 (Long type answer)

Question 1: Points A(5, 3), B(-2, 3) and O(5, -4) are three vertices of a square ABCD. Plot these points on graph paper and hence, find the coordinates of the vertex C.

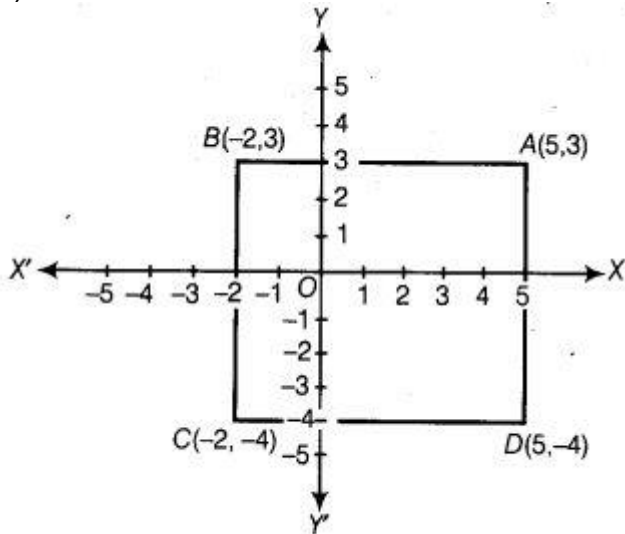
Thinking Process

- (i) Firstly, plot the given points on a graph and join in order.
- (ii) Now, we extend a line from point D parallel to X-axis and extend the other line from point B parallel to Y-axis, which will meet at point C.
- (iii) Further, we measure the distance from point C to the coordinate axis.

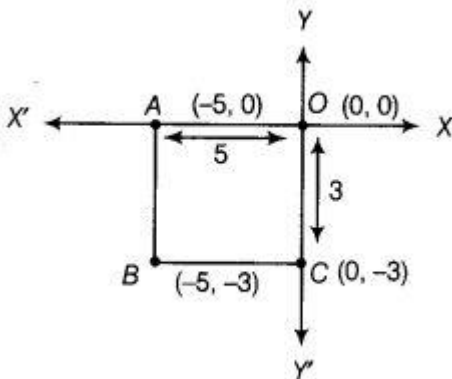
Answer: The graph obtained by plotting the points A, B and C are given below. Take a point C on the graph such that ABCD is a square i.e., all sides AB, BC, CD, and AD are equal.

So, the abscissa of C should be equal to the abscissa of B i.e., -2 and the ordinate of C should be equal to the ordinate of D i.e., -4. Hence, the coordinates of C are (-2, -

4).



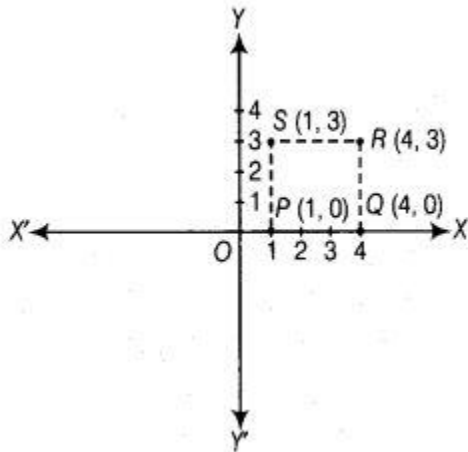
Question 2: Write the coordinates of the vertices of a rectangle whose length and breadth are 5 and 3 units respectively, one vertex at the origin, the longer side on the X-axis and one of the vertices in the third quadrant.



Answer: Given, length of a rectangle = 5 units and breadth of a rectangle = 3 units. One vertex is at origin i.e., $(0, 0)$ and one of the other vertices lies in III quadrant. So, the length of the rectangle is 5 units in the negative direction of the X-axis and then the vertex is $A(-5, 0)$. Also, the breadth of the rectangle is 3 units in the negative, direction of the y-axis and then the vertex is $C(0, -3)$. The fourth vertex B is $(-5, -3)$.

Question 3: Plot the points $P(1, 0)$, $Q(4, 0)$ and $S(1, 3)$. Find the coordinates of the point R such that PQRS is a square.

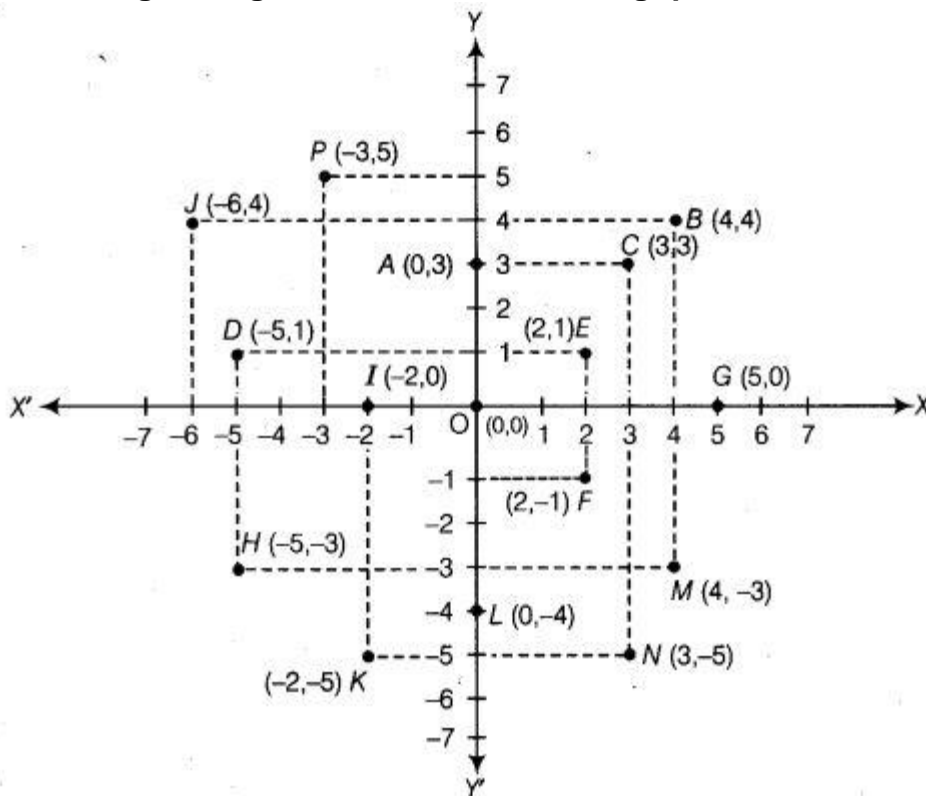
Answer: In point $P(1, 0)$, y-coordinate is zero, so it lies on X-axis. In point $Q(4, 0)$, y-coordinate is zero so it lies on X-axis. In point $S(1, 3)$, both coordinates are positive, so it lies in the I quadrant. On plotting these points, we get the following graph.



Now, take a point R on the graph such that PQRS is a square. Then, all sides will be equal i.e., $PQ = QR = RS = PS$. So, the abscissa of R should be equal to the abscissa of Q i.e., 4 and the ordinate of R should be equal to the ordinate of S i.e., 3. Hence, the coordinates of R are (4, 3).

Question 4:

From the given figure, answer the following questions



- (i) Write the points whose abscissa is 0.
- (ii) Write the points whose ordinate is 0.
- (iii) Write the points whose abscissa is -5,

Answer: (i) We know that the point whose abscissa is 0 will lie on Y-axis. So, the required points whose abscissa is 0 are A, L and O.

(ii) We know that the point whose ordinate is 0 will lie on X-axis. So, the required points, whose ordinate is 0 are G, I and O.

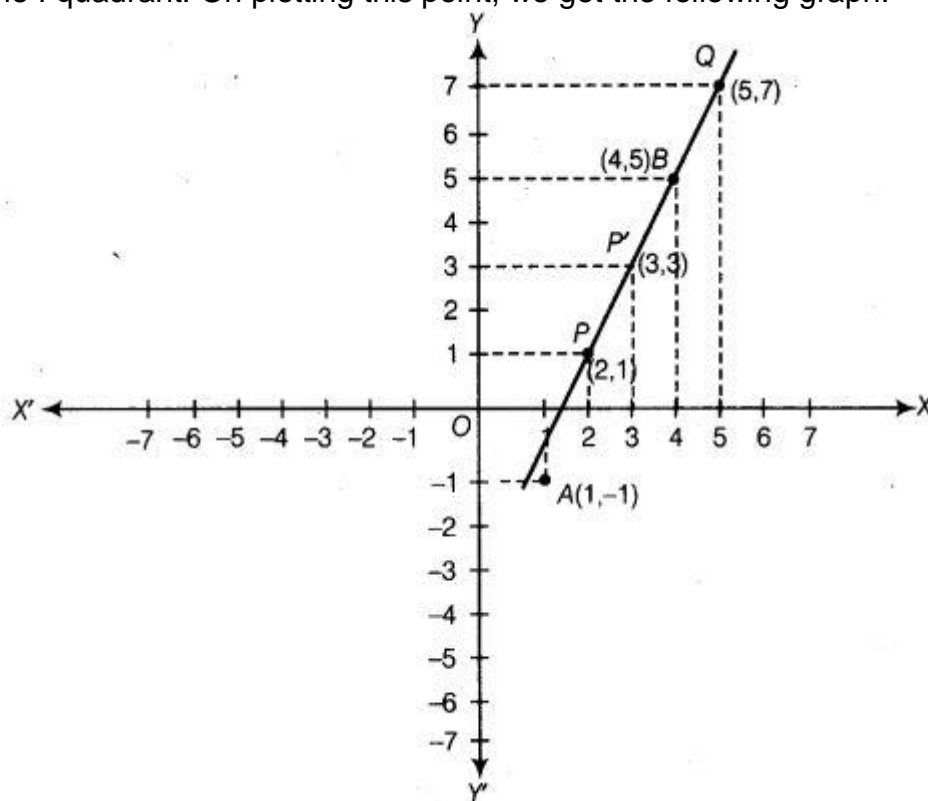
(iii) Here, abscissa '-5' is negative, which shows that the point with abscissa -5 will lie in II and III quadrants. So, the required points whose abscissa is -5, are D and H.

Question 5:

Plot the points A (1, -1) and B (4, 5).

- (i) Draw the line segment joining these points. Write the coordinates of a point on this line segment between points A and B.
- (ii) Extend this line segment and write the coordinates of a point on this line which lies outside the line segment AB.

Answer: In point A(1, -1), x-coordinate is positive and they-coordinate is negative, so it lies in the IV quadrant. In point B(4, 5), both coordinates are positive, so it lies in the I quadrant. On plotting this point, we get the following graph.



(i) On joining points A and B, we get the line segment AB. Now, to find the coordinates of a point on this line segment between A and B draw a perpendicular to X-axis from $x = 2$ and 3 .

[since $x = 2$ and 3 lies between A and B] say it intersects line segment AB at P and p' . Now, draw a perpendicular to Y-axis from P and p' , they intersect Y-axis at $y = 1$ and 3 , respectively. Thus, we get points $(2, 1)$ and $(3, 3)$ which lie between line segment AB.

(ii) Extend the line segment AB. Now, draw a perpendicular to X-axis from $x = 5$, say it intersects the extended line segment at Q. Again, draw a perpendicular to Y-axis from Q and it intersects Y-axis at $y = 7$. Thus, we get the point $Q(5, 7)$ which lies outside the line segment AB.

