

STD 9 Maths [Manjari]
Coordinate Geometry

*** Choose the right answer from the given options. [1 Marks Each]**

[40]

1. Which of the following points does not lie in any quadrant?
(A) (1, 2) (B) (4, 4) (C) (-2,-1) (D) (0, 5)
2. The coordinates of two points A and B are (5, 7) and (5,5). The length of the line segment AB is 7 -(-5) units. This statement is:
(A) true (B) false (C) can't say (D) none of these
3. The coordinates of a point are (2, 8). Its distance from x-axis is:
(A) 2 units (B) 8 units (C) (2 + 8) units (D) $\sqrt{2^2 + 8^2}$ units
4. Abscissa of all the points on the x-axis is:
(A) 0 (B) 1 (C) 2 (D) any number
5. The point at which the two coordinate axes meet is called the:
(A) Abscissa (B) Ordinate (C) Origin (D) Quadrant
6. A point both of whose co-ordinates are negative will lie in:
(A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
7. 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
8. The point whose ordinate is 4 and which lies on y-axis is:
(A) (4, 0) (B) (0, 4) (C) (1, 4) (D) (4, 2)
9. Which of the points P(0, 3), Q(1, 0), R(0, -1), S(-5, 0), T(1, 2) do not lie on the x-axis?
(A) P and R only (B) Q and S only (C) P, R and T (D) Q, S and T
10. The point which lies on y-axis at a distance of 5 units in the negative direction of y-axis is:
(A) (0, 5) (B) (5, 0) (C) (0, -5) (D) (-5, 0)
11. If the co-ordinates of a point are (-5, 6), the perpendicular distance of the point from x-axis is:
(A) 5 units (B) 6 units (C) 7 units (D) 7.5 units
12. The co-ordinates of the point whose ordinate is -4 and which lies at y-axis are:
(A) (0, -4) (B) (4, 0) (C) (-4, 0) (D) (0, 4)
13. If the distance between the points (2, -2) and (-1, x) is 5, one of the value of x is:

- (A) -2 (B) 2 (C) -1 (D) 1
14. The mid-point of the line segment joining the points A(-2, 8) and B(-6, -4) is:
 (A) (-4, -6) (B) (2, 6) (C) (-4, 2) (D) (4, 2)
15. The distance between the points A(0, 6) and B(0, -2) is:
 (A) 6 (B) 8 (C) 4 (D) 2
16. The distance of the point P(-6,8) from the origin is:
 (A) 8 (B) $2\sqrt{7}$ (C) 10 (D) 6
17. The centre of a circle is at (2, 0). if one end of a diameter is at (6, 0), then the other end is at:
 (A) (0,0) (B) (4, 0) (C) (-2, 0) (D) (-6, 0)
18. The points (-4, 0), (4, 0) and (3, 0) are the vertices of a/an:
 (A) Right triangle (B) Isosceles triangle
 (C) Equilateral triangle (D) Scalene triangle
19. Abscissa of all the points on the x -axis is :
 (B) 1 (C) 2 (D) any number
20. A point both of whose co-ordinates are negative will lie in :
 (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
21. If the co-ordinates of a point are (-5,6), the perpendicular distance of the point from x -axis is :
 (A) 5 units (B) 6 units (C) 7 units (D) 7.5 units
22. If the distance between the points (2,-2) and (-1, x) is 5, one of the value of x is:
 (A) -2 (B) 2 (C) -1 (D) 1
23. The centre of a circle is at (2,0). If one end of a diameter is at (6,0), then the other end is at:
 (A) (0,0) (B) (4,0) (C) (-2,0) (D) (-6,0)
24. The coordinates of a point are (2,8). Its distance from x -axis is:
 (A) 2 units (B) 8 units (C) (2 + 8) units (D) $\sqrt{2^2 + 8^2}$ units
25. The co-ordinates of the point whose ordinate is -4 and which lies at y -axis are :
 (A) (0,-4) (B) (4,0) (C) (-4,0) (D) (0,4)
26. The coordinates of two points A and B are (5,7) and (5,-5). The length of the line segment AB is $7 - (-5)$ units. This statement is :
 (A) 1 (C) can't say (D) none of these
27. The distance between the points A(0,6) and B(0,-2) is:

- (A) 6 (B) 8 (C) 4 (D) 2
28. The distance of the point $P(-6,8)$ from the origin is:
 (A) 8 (B) $2\sqrt{7}$ (C) 10 (D) 6
29. The mid-point of the line segment joining the points $A(-2,8)$ and $B(-6,-4)$ is:
 (A) $(-4,-6)$ (B) $(2,6)$ (C) $(-4,2)$ (D) $(4,2)$
30. The point at which the two coordinate axes meet is called the :
 (A) Abscissa (B) Ordinate (C) Origin (D) Quadrant
31. The points $(-4,0)$, $(4,0)$ and $(3,0)$ are the vertices of a/an:
 (A) Right triangle (B) Isosceles triangle
 (C) Equilateral triangle (D) Scalene triangle
32. 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
33. The point which lies on y -axis at a distance of 5 units in the negative direction of y -axis is :
 (A) $(0,5)$ (B) $(5,0)$ (C) $(0,-5)$ (D) $(-5,0)$
34. The point whose ordinate is 4 and which lies on y -axis is:
 (A) $(4,0)$ (B) $(0,4)$ (C) $(1,4)$ (D) $(4,2)$
35. Which of the following points does not lie in any quadrant?
 (A) $(1,2)$ (B) $(4,4)$ (C) $(-2,-1)$ (D) $(0,5)$
36. Which of the points $P(0,3)$, $Q(1,0)$, $R(0,-1)$, $S(-5,0)$, $T(1,2)$ do not lie on the x -axis?
 (A) P and R only (B) Q and S only (C) P, R and T (D) Q, S and T
37. Point $(-1,-1)$ lies in
 (A) 1st quadrant (B) 2nd quadrant (C) 3rd quadrant (D) 4th quadrant
38. Point $(0,-6)$ lies
 (A) on the-ve side of y -axis (B) on x -axis
 (C) in 1st quadrant (D) in 2nd quadrant
39. The perpendicular distance of the point $(4,5)$ from the y -axis is
 (A) 5 (B) 4 (C) 4.5 (D) 1
40. The coordinates of the point which lies on y -axis at a distance of 4 units in negative direction of y -axis

(A) $(-4, 0)$

(B) $(4, 0)$

(C) $(0, -4)$

(D) $(0, 4)$

* A statement of Assertion (A) is followed by a statement of Reason (R). [18]
Choose the correct option.

Directions: In each question below, there are two statements labelled as Assertion (A) and Reason (R). Choose the correct answer as per the options given below:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (c) (A) is true but (R) is false
- (d) (A) is false but (R) is true

41. Assertion (A): $(-3, 4)$ lies to the left of the y -axis.

Reason (R): Abscissa is negative to the right of y -axis.

42. Assertion (A): $(-11, -13)$ lies in IV quadrant.

Reason (R): Abscissa and ordinate are negative in III quadrant.

43. Assertion (A): The abscissa is 9 and ordinate is -6, the coordinates of the point is $(9, -6)$.

Reason (R): The point $(2, 3)$ lies in II quadrant.

44. Assertion (A): The ordinate of point $(-6, 4)$ is 4.

Reason (R): The perpendicular distance of a point from x -axis is called its ordinate.

45. Assertion (A): If $a \neq b$ then $(a, b) \neq (b, a)$.

Reason (R): $(-1, -2)$ lies in quadrant III.

46. Assertion (A): Points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

Reason (R): Three points are said to be collinear, when they all lie of the same line.

47. The coordinates of the midpoint P of the join of the points $A(x_1, y_1)$ and $B(x_2, y_2)$ is $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$.

Reason (R): The mid-point of a line segment divides the line segment in the ratio 1: 1.

48. Assertion (A) : $(-11, -13)$ lies in IV quadrant.

Reason (R) : Abscissa and ordinate are negative in III quadrant.

49. Assertion (A) : $(-3, 4)$ lies to the left of the y -axis.

Reason (R) : Abscissa is negative to the right of y -axis.

50. Assertion (A) : If $a \neq b$, then $(a, b) \neq (b, a)$.

Reason (R) : $(-1, -2)$ lies in quadrant III.

51. Assertion (A) : Points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

Reason (R) : Three points are said to be collinear, when they all lie of the same

line.

52. Assertion (A) : The abscissa is 9 and ordinate is -6 , the coordinates of the point is $(9, -6)$.

Reason (R) : The point $(2, 3)$ lies in II quadrant.

53. Assertion (A) : The coordinates of the midpoint P of the join of the points $A(x_1, y_1)$ and $B(x_2, y_2)$ is $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$.

Reason (R) : The mid-point of a line segment divides the line segment in the ratio $1 : 1$.

54. Assertion (A) : The ordinate of point $(-6, 4)$ is 4.

Reason (R) : The perpendicular distance of a point from x -axis is called its ordinate.

55. Assertion (A): Point $A(-2, -6)$ lies in III quadrant.

Reason (R): A point both of whose coordinates are negative lies in III quadrant.

(A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

56. Assertion (A): The abscissa of a point $(4, 3)$ is 4.

Reason (R): The perpendicular distance of a point from y -axis is called its abscissa.

(A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

57. Assertion (A): The point $(7, 0)$ lies on y -axis.

Reason (R): The y co-ordinate of the point on x -axis is zero.

(A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

58. Assertion (A): Point $(5, -3)$ lies in IV quadrant.

Reason (R): The perpendicular distance of a point from y-axis is called its abscissa.

(A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(C) Assertion (A) is true but reason (R) is false.

(D) Assertion (A) is false but reason (R) is true.

*** Answer the following questions. [3 Marks Each]**

[90]

59. Point W has x-coordinate equal to -5 . Can you predict the coordinates of point H which is on the line through W parallel to the y-axis? Which quadrants can H lie in?

60. Are the points M $(-3, -4)$, A $(0, 0)$ and G $(6, 8)$ on the same straight line? Suggest a method to check this without plotting and joining the points.

61. Use your method (from Problem 6) to check if the points R $(-5, -1)$, B $(-2, -5)$ and C $(4, -12)$ are on the same straight line.

62. A computer graphics program displays images on a rectangular screen whose coordinate system has the origin at the bottom-left corner.

The screen is 800 pixels wide and 600 pixels high. A circular icon of radius 80 pixels is drawn with its centre at the point A $(100, 150)$. Another circular icon of radius 100 pixels is drawn with its centre at the point B $(250, 230)$. Determine:

(i) whether any part of either circle lies outside the screen.

(ii) whether the two circles intersect each other.

63. Find the point on the x -axis which is equidistant from A $(2, -5)$ and B $(-2, 9)$.

64. Determine if the points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

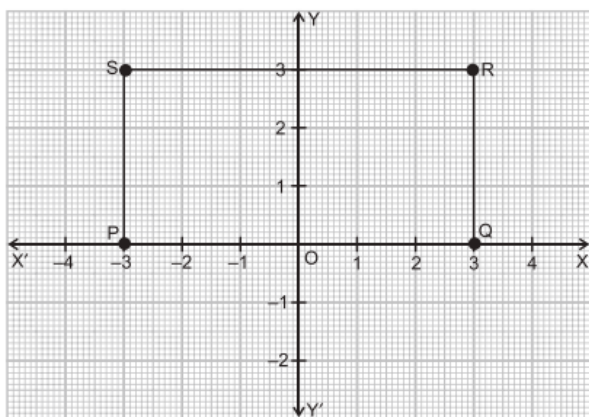
65. Find the distance between the following pairs of points :

(i) $(2, 3)$, $(4, 1)$ (ii) $(-5, 7)$, $(-1, 3)$ (iii) (a, b) , $(-a, -b)$

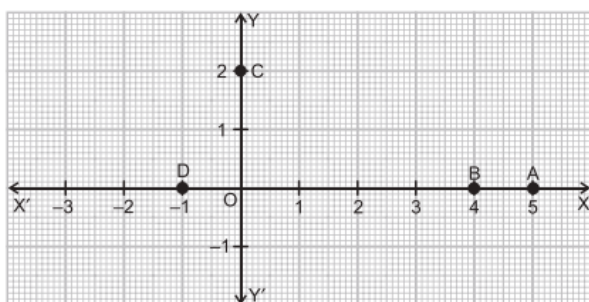
66. On which axes do the following point lie?

(i) P $(0, -5)$ (ii) Q $(4, 0)$ (iii) C $(-3, 0)$

67. In the figure, PQRS is a rectangle with length 6 cm and breadth 3 cm. O is the mid-point of PQ. Find the co-ordinates of P, Q, R and S.



68. If $A(-2,1)$, $B(a,0)$, $C(4,b)$ and $D(1,2)$ are the vertices of a parallelogram ABCD, find the values of a and b . Hence find the length of its sides.
69. Prove that the points $(3,0)$, $(6,4)$ and $(-1,3)$ are vertices of a right-angled isosceles triangle.
70. Show that the points $(-2,5)$, $(3,-4)$ and $(7,10)$ are the vertices of a right angled isosceles triangle.
71. Prove that, the points $(2,-2)$, $(-2,1)$ and $(5,2)$ are the vertices of a right triangle. Also, find the area of this triangle.
72. Write the co-ordinates of the point:
- whose ordinate is -5 and which lies on y -axis.
 - which lies on x and y axes both.
 - whose abscissa is -3 and which lies on x -axis.
73. Write the co-ordinates of the vertices of a rectangle whose length and breadth are 4 units and 3 units respectively, has one vertex at the origin, the longer side is on the x -axis and one of the vertices lies in the IVth quadrant. Also, find its area.
74. Write the coordinates of the points A, B, C, D, marked on the coordinate axes, in the given figure.



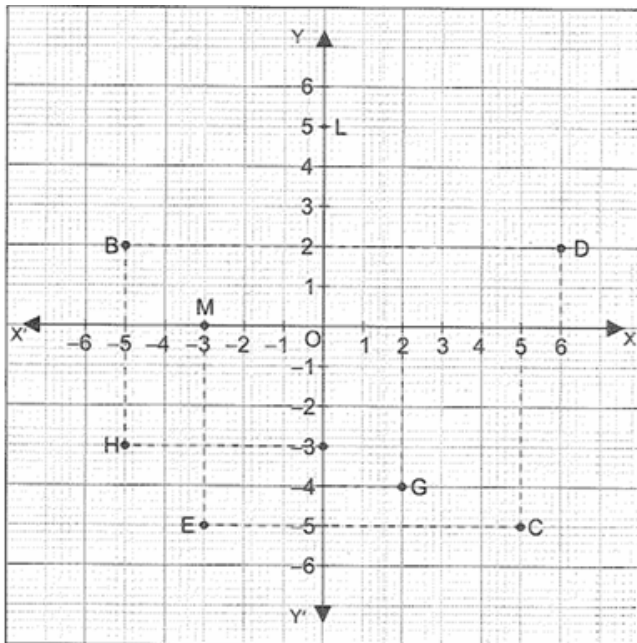
75. **Triangular Field Measurement:** A farmer marks his field corners at A $(1, 1)$, B $(5, 9)$ and C $(9, 1)$. He wants to install a water pipeline along the hypotenuse if the field is right-angled. Verify whether the field forms a right-angled triangle.
76. Write the answer of each of the following questions:
- What are the names of horizontal and 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.

77. See fig. 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.

78. Plot the points $A(-5, -2)$, $B(1, -2)$, $C(6, 4)$ and $D(0, 4)$. Join the points to get AB, BC, CD Name the so obtained.

79. The length of perpendiculars PM and PN drawn from a point P, on x-axis and y-axis are of 3 and 2 units, respectively. Find the coordinates of the points P, M and N.

80. The perpendicular distance of a point from the x-axis is 4 units and the perpendicular distance from the y-axis is 5 units. Write the co-ordinates of such a point if it lies in the

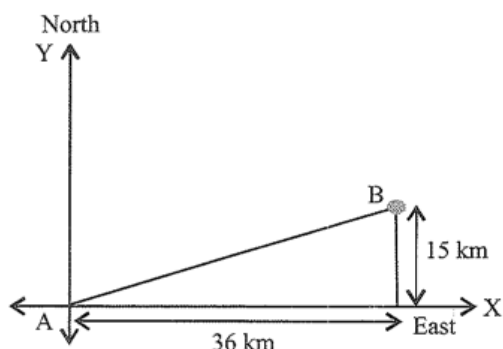
(i) 1st quadrant, (ii) 2nd quadrant

(iii) 3rd quadrant, (iv) 4th quadrant

81. Coordinates of A and B are $(-3, a)$ and $(1, a + 4)$. The mid-point of AB is $(-1, 1)$. Find the value of a .

82. Points $P(-5, x)$, $Q(y, 7)$ and $R(1, -3)$ are collinear such that $PQ = QR$. Calculate the values of x and y .

83. (i) Find the distance between the points $(0,0)$ and $(36,15)$.
 (ii) A town B is located 36 km east and 15 km north of the town A, which is densely populated. How would you find the distance from town A to town B without actually measuring it.
 Let us see. This situation can be represented graphically as shown in fig.

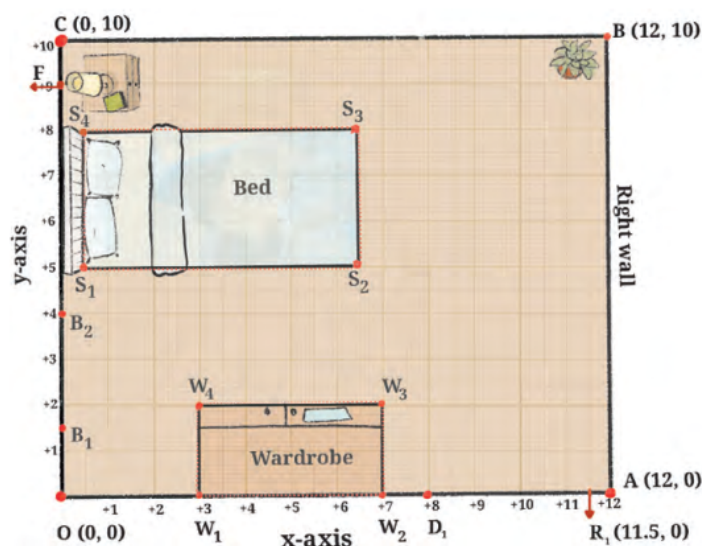


84. Find the perimeter of the $\triangle PQR$ where coordinates of vertices are $P(3,1)$, $Q(7,4)$ and $R(11,1)$.
 85. Find the point on the x-axis which is equidistant from $(2,-5)$ and $(-2,9)$.
 86. Find the value of k , if the point $P(0,2)$ is equidistant from $(3,k)$ and $(k,5)$.
 87. Find the coordinates of a point whose abscissa is equal to its ordinate and which is equidistant from $A(5,0)$ and $B(0,3)$.
 88. Find the point on the y-axis which is equidistant from $(-5,-2)$ and $(3,2)$

*** Questions with calculation. [4 Marks Each]**

[120]

89. Fig. shows Reiaan's room with points OABC marking its corners. The x- and y-axes are marked in the figure. Point O is the origin.

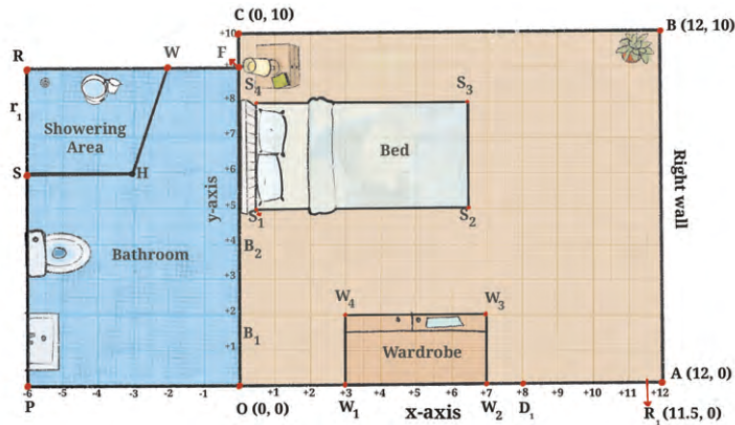


- (i) If D_1R_1 represents the door to Reiaan's room, how far is the door from the left wall (the y-axis) of the room? How far is the door from the x-axis?
 (ii) What are the coordinates of D_1 ?
 (iii) If R_1 is the point $(11.5,0)$, how wide is the door? Do you think this is a

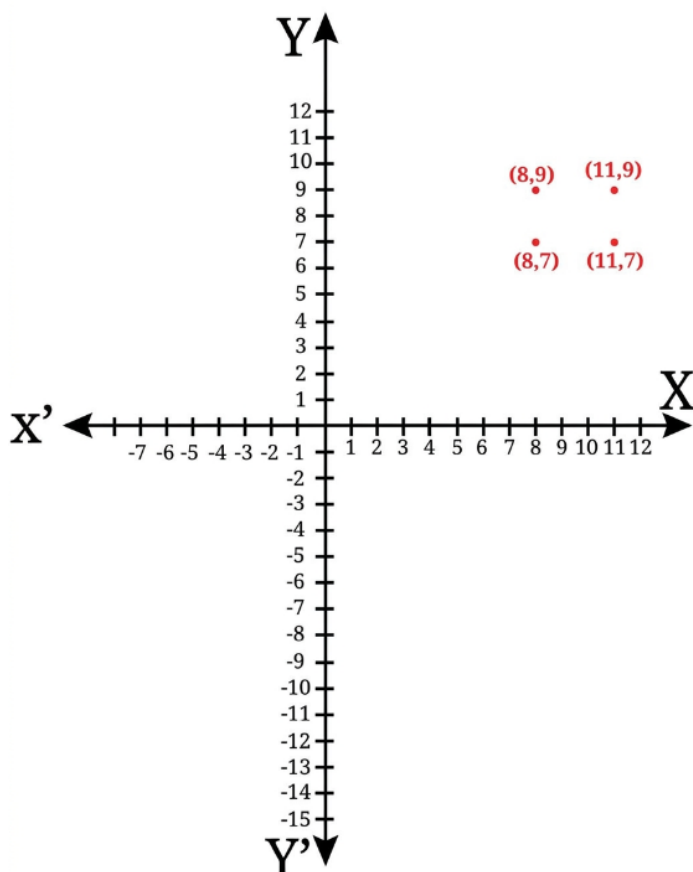
comfortable width for the room door? If a person in a wheelchair wants to enter the room, will she/he be able to do so easily?

(iv) If $B_1 (0, 1.5)$ and $B_2 (0, 4)$ represent the ends of the bathroom door, is the bathroom door narrower or wider than the room door?

90. On a graph sheet, mark the x-axis and y-axis and the origin O. Mark points from $(-7, 0)$ to $(13, 0)$ on the x-axis and from $(0, -15)$ to $(0, 12)$ on the y-axis. (Use the scale 1 cm = 1 unit.) Using Fig. answer the given questions.



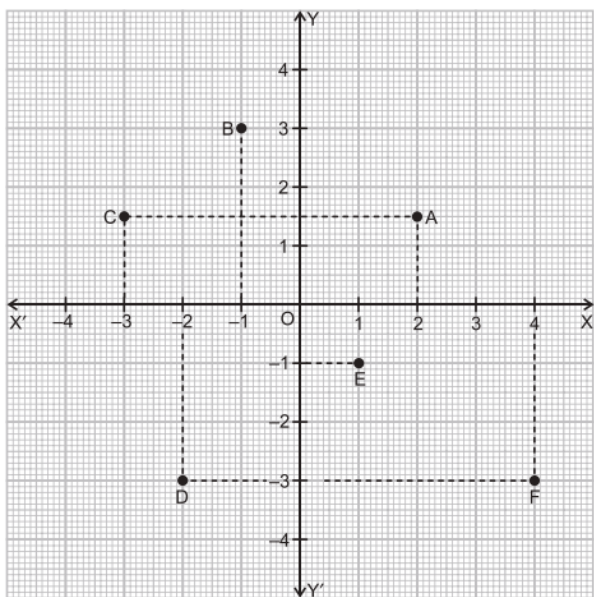
1. Place Reiaan's rectangular study table with three of its feet at the points $(8, 9)$, $(11, 9)$ and $(11, 7)$.



- Where will the fourth foot of the table be?
- Is this a good spot for the table?
- What is the width of the table? The length? Can you make out the height of the table?

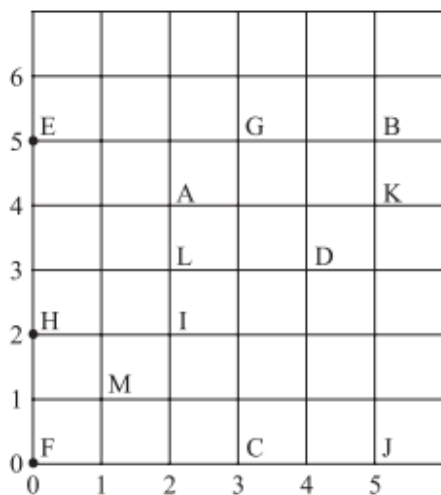
2. If the bathroom door has a hinge at B_1 and opens into the bedroom, will it hit the wardrobe? Are there any changes you would suggest if the door is made wider?
 3. Look at Reiaan's bathroom.
 - (i) What are the coordinates of the four corners O, F, R, and P of the bathroom?
 - (ii) What is the shape of the showering area SHWR in Reiaan's bathroom? Write the coordinates of the four corners.
 - (iii) Mark off a 3 ft $\times$ 2 ft space for the washbasin and a 2 ft $\times$ 3 ft space for the toilet. Write the coordinates of the corners of these spaces.
 4. Other rooms in the house:
 - (i) Reiaan's room door leads from the dining room which has length 18 ft and width 15 ft. The length of the dining room extends from point P to point A. Sketch the dining room and mark the coordinates of its corners.
 - (ii) Place a rectangular 5 ft $\times$ 3 ft dining table precisely in the centre of the dining room. Write down the coordinates of the feet of the table.
91. Using the origin as one vertex, plot the vertices of:
 - (i) A right-angled isosceles triangle.
 - (ii) An isosceles triangle with one vertex in Quadrant III and the other in Quadrant IV.
 92. Do the points $(3,2)$, $(-2,-3)$ and $(2,3)$ form a triangle? If, so name the type of triangle formed.
 93. Find the co-ordinates of a point A, where AB is the diameter of a circle whose centre is $(2,-3)$ and $B(1,4)$.
 94. Find the area of the triangle whose vertices are $(0,4)$, $(0,0)$ and $(2,0)$ by plotting these points on a graph paper.
 95. In which quadrant will the point lie if its:
 - (i) the ordinate is 8 and the abscissa is -4 .
 - (ii) the abscissa is -6 and the ordinate is -3 .
 - (iii) the ordinate is 4 and the abscissa is 5.
 - (iv) the ordinate is 4 and the abscissa -4 .
 96. Find the length of the median AD of $\triangle ABC$ having vertices $A(0,-1)$, $B(2,1)$ and $C(0,3)$.
 97. Find the coordinates of the mid-point of the line segment whose endpoints are:
 - (i) $A(4,3)$ and $B(-6,5)$ (ii) $P(0,-8)$ and $Q(10,8)$ (iii) $L(-7,-9)$ and $M(-3,3)$ (iv) $R(-3a,4b)$ and $S(a,-3b)$
 98. Show that the points $A(5,6)$, $B(1,5)$, $C(2,1)$ and $D(6,2)$ are the vertices of a square.
 99. If the point $P(x,y)$ is equidistant from the points $A(3,6)$ and $B(-3,4)$, prove that $3x + y - 5 = 0$.

100. Write down the coordinates of the points A, B, C, D, E and F, as shown in figure given below



101. In which quadrant will the point lie, if its
 (i) ordinate is 2 and the abscissa is -3 ?
 (ii) abscissa is -4 and the ordinate is -2 ?
 (iii) ordinate is 3 and the abscissa is 4 ?
 (iv) ordinate is 3 and the abscissa is -2 ?

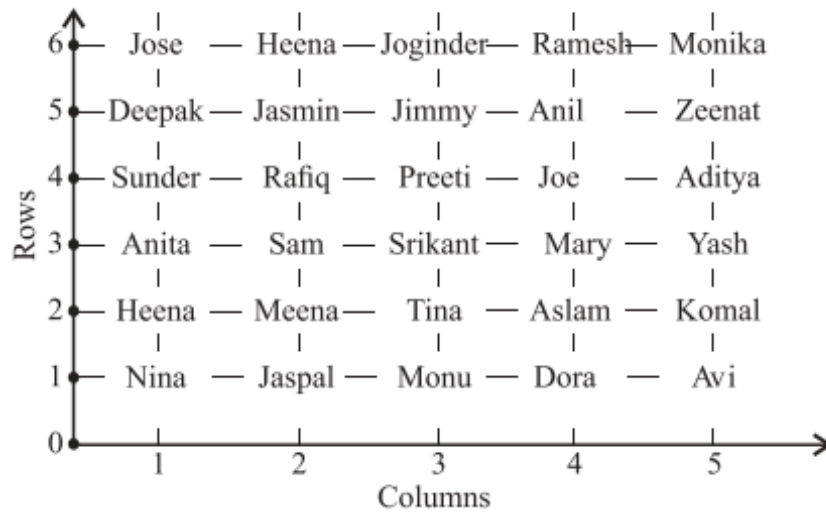
102.



Use figure to write the ordered pairs to locate the position of each of the following points.

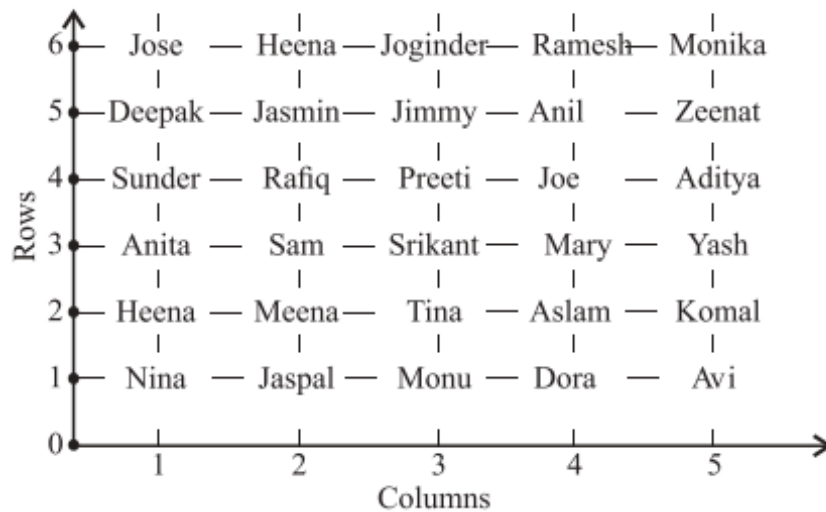
- (i) M, (ii) G, (iii) E, (iv) J, (v) F, (vi) I, (vii) K, (viii) H, (ix) D, (x) L

103.



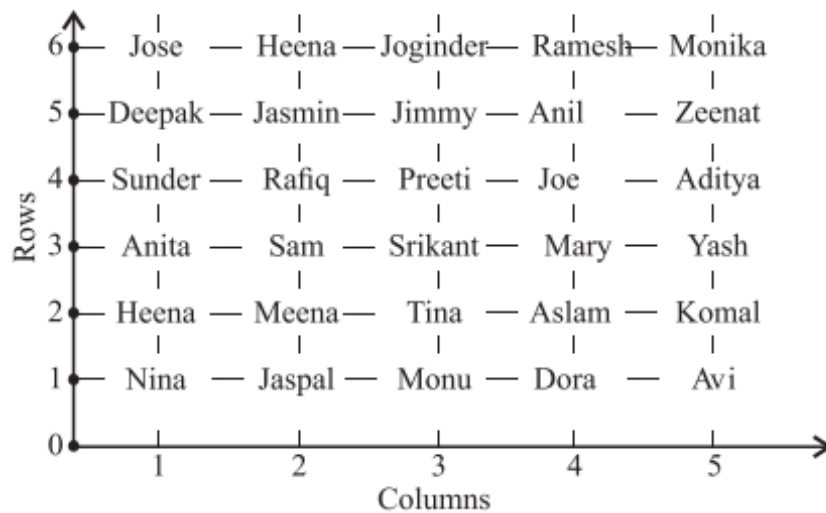
Write the names and number pairs for the locations of all the students who are sitting in the sixth row (in figure).

104.



Write the names and number pairs for the locations of all the students who are seated in the second column (in figure).

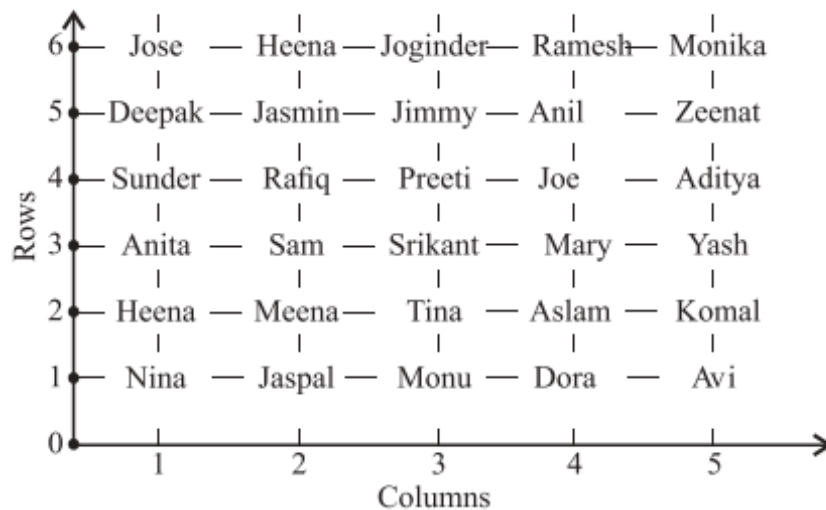
105.



Name the students whose position is located by each of the following number pairs (in figure).

- (i) (3,1), (ii) (1,3), (iii) (1,1), (iv) (5,5), (v) (4,6), (vi) (1,6), (vii) (4,2), (viii) (5,3)

106.



Using figure locate the positions of the following students by using number pairs.

- (i) Tina, (ii) Yash, (iii) Anita, (iv) Rafiq, (v) Joginder, (vi) Srikant, (vii) Komal, (viii) Sam

107. 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

108. (i) Plot a point A on the graph paper whose abscissa is 4 and ordinate is 3.
(ii) Plot a point B on the graph paper whose abscissa is -2 and ordinate is 4.
(iii) Plot a point C on the graph paper whose abscissa is -3 and ordinate is 3.5.
(iv) Plot a point D on the graph paper whose abscissa is zero and ordinate is 4.

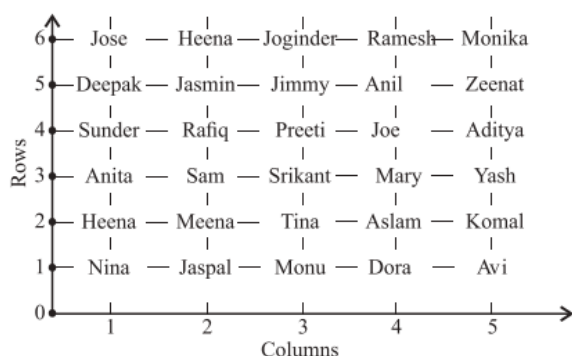
109. Let $A = (-5, 3)$, $B = (6, 0)$ and $C(5, 5)$. Plot the points A, B and C and draw the triangle ABC.
110. Plot the points $A(0, 4)$, $B(-3, 0)$, $C(0, -4)$ and $D(3, 0)$. Name the figure obtained by joining the points A, B, C, D. Also, name the quadrant in which the sides AB and AD lie.
111. The line segment joining $A(-3, 1)$ and $B(5, -4)$ is a diameter of a circle whose centre is O. Find the coordinates of centre O.
112. Find the coordinates of point A, where AB is the diameter of a circle whose centre is $(2, -3)$ and B is $(1, 4)$.
113. Points $P(-5, x)$, $Q(y, 7)$ and $R(1, -3)$ are collinear such that $PQ = QR$. Calculate the values of x and y.
114. The coordinates of the mid-point of the line joining the points $(2p + 1, 4)$ and $(5, q - 1)$ are $(2p, q)$. Find the values of p and q.
115. Using distance formula, show that the points, $(-3, 2)$, $(1, -2)$ and $(9, -10)$ are collinear.
116. Find the values of y for which the distance between the points $P(2, -3)$ and $Q(10, y)$ is 10 units.
117. Find a relation between x and y such that the point (x, y) is equidistant from the points $(3, 6)$ and $(-3, 4)$.
118. Since the point $P(x, y)$ is equidistant from the points $A(a + b, b - a)$ and $B(a - b, a + b)$, prove that $bx = ay$.

*** Answer the following questions. [5 Marks Each]**

[150]

119. Consider the points R $(3, 0)$, A $(0, -2)$, M $(-5, -2)$ and P $(-5, 2)$. If they are joined in the same order, predict:
- (i) Two sides of RAMP that are perpendicular to each other.
 - (ii) One side of RAMP that is parallel to one of the axes.
 - (iii) Two points that are mirror images of each other in one axis. Which axis will this be?
120. Plot point Z $(5, -6)$ on the Cartesian plane. Construct a right-angled triangle IZN and find the lengths of the three sides.
121. Let P, Q be points of trisection of AB, with P closer to A, and Q closer to B.
122. (i) Given the points A $(1, -8)$, B $(-4, 7)$ and C $(-7, -4)$, show that they lie on a circle K whose center is the origin O $(0, 0)$. What is the radius of circle K?
- (ii) Given the points D $(-5, 6)$ and E $(0, 9)$, check whether D and E lie within the circle, on the circle, or outside the circle K.

123. The midpoints of the sides of triangle ABC are the points D, E, and F. Given that the coordinates of D, E, and F are (5, 1), (6, 5), and (0, 3), respectively, find the coordinates of A, B and C.
124. Plot the points A (2, 1), B (-1, 2), C (-2, -1), and D (1, -2) in the coordinate plane. Is ABCD a square? Can you explain why? What is the area of this square?
125. Find the lengths of the medians of a $\triangle ABC$ whose vertices are $A(7, -3)$, $B(5, 3)$ and $C(3, -1)$.
126. If $P(2, -1)$, $Q(3, 4)$, $R(-2, 3)$ and $S(-3, -2)$ be four points in a plane, show that PQRS is a rhombus but not a square.
127. Show that the point $A(2, -2)$, $B(8, 4)$, $C(5, 7)$ and $D(-1, 1)$ are the vertices of a rectangle ABCD.
128. If (a, b) is the mid-point of the line segment joining the points $A(10, -6)$ and $B(k, 4)$ and $a - 2b = 18$, find the value of k and the distance AB.
129. If $(1, 2)$, $(4, y)$, $(x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y .
130. Write whether the following statements are true or false. Justify your answer.
- Point (3, 0) lies in the first quadrant.
 - Points (1, -1) and (-1, 1) lie in the same quadrant.
 - The coordinates of a point whose ordinate is $-\frac{1}{2}$ and abscissa is 1 are $(-\frac{1}{2}, 1)$.
 - A point lies on y -axis at a distance of 2 units from the x -axis, its coordinates are (2, 0).
 - $(-1, 7)$ is a point in the II quadrant.
131. ABCD is a quadrilateral formed by the points $A(-1, -1)$, $B(-1, 6)$, $C(3, 6)$ and $D(3, -1)$. P, Q, R and S are midpoints of sides AB, BC, CD and DA respectively. Show that diagonals of quadrilateral bisect each other.
132. Show that the points $A(2, -2)$, $B(14, 10)$, $C(11, 13)$ and $D(-1, 1)$ are the vertices of a rectangle.
133. Make a seating plan of your class (as shown in fig).



- (i) Write the roll number and name of the student as it appears in the class

register and assign the ordered pair denoting his/her seat in the class. You may draw a table similar to the following :

Roll No.	Name	Location as an ordered pair
1.	Aditya	(5,4)
2.	...	...
3.	...	...
...	...	...

(ii) Write the name and location of all the students in your class whose first letter of the name is the same as that of yours.

134. Plot the following points on the graph paper and indicate in which quadrant or on which coordinate axis these points lie:
 (i) $(-2,0)$, (ii) $(0,5)$, (iii) $(0,0)$
 (iv) $(3,-2)$, (v) $(-5,-1)$, (vi) $(0,-3/2)$
135. Plot the points $A(0,0)$, $B(4,-2)$, $C(8,0)$ and $D(4,2)$. Join these points in the given order. Show that BD is the perpendicular bisector of AC. What type of quadrilateral is ABCD?
136. Plot the points $M(5,-3)$ and $N(-3,-3)$.
137. What is the length of MN?
138. Find the coordinates of the points A, B and C lying on MN such that $MA = AB = BC = CN$.
139. Show that points A, B and C are collinear by plotting the points in a certain plane $A(-1,2)$, $B(2,-1)$ and $C(4,-3)$.
 [Hint: Plot these points and show that they lie on the same straight line]
140. $A(10,5)$, $B(6,-3)$ and $C(2,1)$ are the vertices of a triangle ABC. L is the mid-point of AB and M is the midpoint of AC. Write down the coordinates of L and M. Show that $LM = \frac{1}{2}BC$.
141. The coordinates of one end point of a diameter AB are $(4,3)$ and the coordinates of centre are $(1,1)$. Find the coordinates of other end of diameter.
142. Find the lengths of the medians of the triangle whose vertices are $(1,-1)$, $(0,4)$ and $(-5,3)$.
143. In the given figure, a right triangle BOA is given and C is the mid-point of the hypotenuse AB. Show that C is equidistant from the vertices O, A and B.

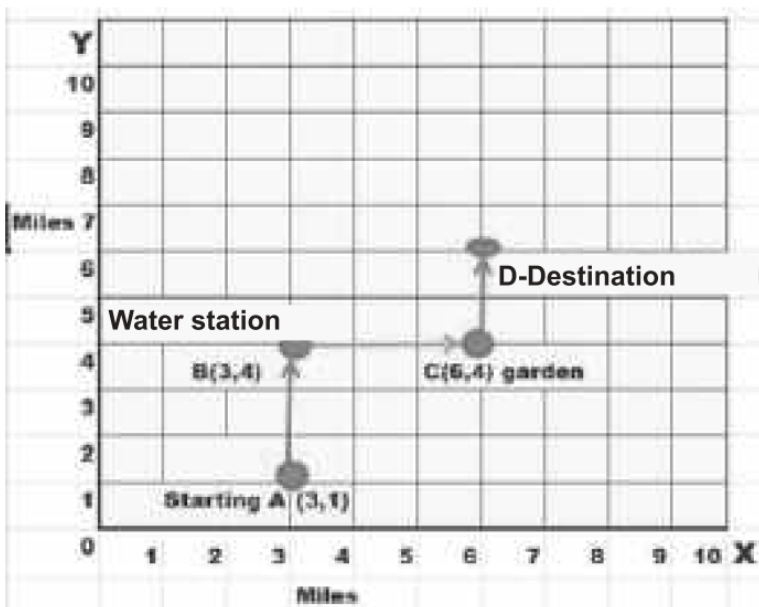
144. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in figure given below Niharika runs $\frac{1}{4}th$ the distance AD on the 2nd line and posts a green flag. Preet runs $\frac{1}{5}th$ the distance AD on the eighth line and posts a red flag. What is the distance between both the flags? If Rashmi has to post a blue flag exactly halfway the two flags, where should she post her flag?
145. The line segment joining $A(2,3)$ and $B(-3,5)$ is extended through each end and by a length equal to its original length. Find the coordinates of the new ends.
146. If $Q(0,1)$ is equidistant from $P(5,-3)$ and $R(x,6)$, find the value of x . Also, find the distance QR and PR.
147. (i) If 'a' is the length of one of the sides of an equilateral triangle ABC, base BC lies on x-axis and vertex B is at the origin, find the coordinates of the vertices of the triangle ABC.
(ii) Find the coordinates of the point equidistant from three given points $A(5,3)$, $B(5,-5)$ and $C(1,-5)$.
148. The opposite angular points of a square are $(5,4)$ and $(-1,6)$. Find the coordinates of the remaining two vertices.

*** Case study based questions.**

[24]

Arun is participating in an 8 miles walk. The organizers used a square coordinate grid to plot the course. The starting point is at A (3, 1). At B (3, 4), there's a water station to make sure the walkers stay hydrated.

From water station, the walkway turns right and at C(6, 4), a garden is situated to keep walkers fresh. From the garden, the walkway turns left and finally, Arun reaches at destination D to complete 8 miles.

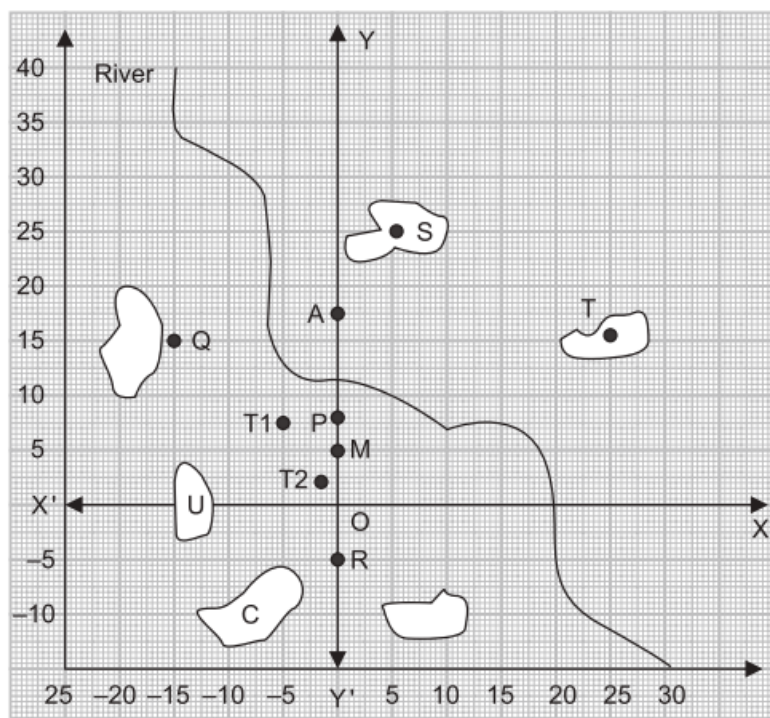


Based on the above information, answer the following questions:

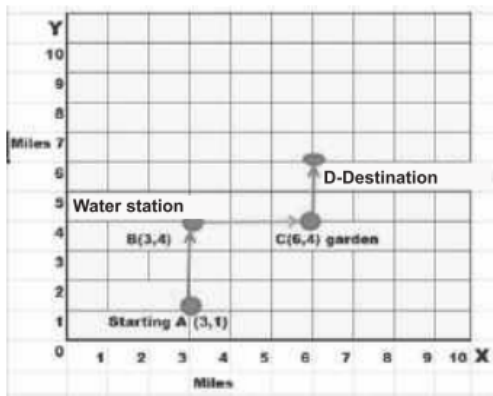
149. How far is the water station B from the starting point A?
150. How far is the water station B from garden C?
151. What is the abscissa of destination point D?
152. What are the coordinates of destination point D?

National Park: A national park is an area set aside by the government to preserve and protect natural environment.

The graph below shows a map of the National Park. The shaded areas indicate woods. The plain areas indicate meadows and fields without trees. Point O on the graph represents the location of the park's supervisor's office, and points P and Q are the ranger's towers.



153. Find the distance between the towers $P(0, 7.5)$ and $Q(-15, 15)$
154. Find the distance of the point $S(5, 25)$ from x-axis.
155. Find the point on x-axis (other than O) equidistant from the points $R(0, -5)$ and $M(0, 5)$.
156. There are two trees $T_1(-5, 7)$ and $T_2(-1, 3)$ in the park.
Find the coordinates of the mid-point of the line segment joining both the trees.
157. Arun is participating in an 8 miles walk. The organizers used a square coordinate grid to plot the course. The starting point is at $A(3, 1)$. At $B(3, 4)$, there's a water station to make sure the walkers stay hydrated.
From water station, the walkway turns right and at $C(6, 4)$, a garden is situated to keep walkers fresh. From the garden, the walkway turns left and finally, Arun reaches at destination D to complete 8 miles.

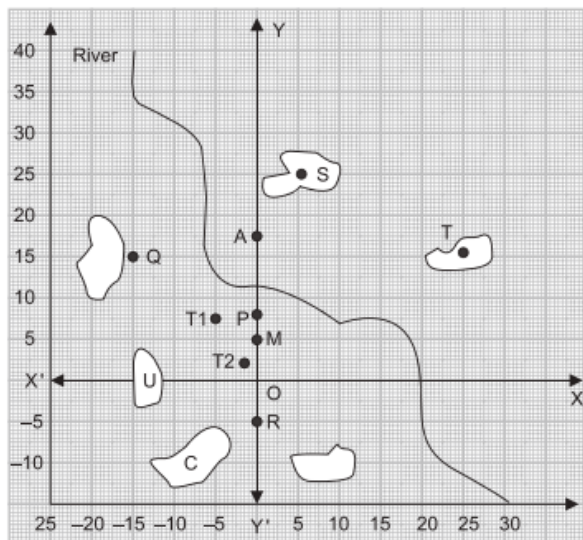


Based on the above information, answer the following questions :

- (i) How far is the water station B from the starting point A?
- (ii) How far is the water station B from garden C?
- (iii) What is the abscissa of destination point D?
- (iv) What are the coordinates of destination point D?

158. **National Park** : A national park is an area set aside by the government to preserve and protect natural environment.

The graph below shows a map of the National Park. The shaded areas indicate woods. The plain areas indicate meadows and fields without trees. Point O on the graph represents the location of the park's supervisor's office, and points P and Q are the ranger's towers.



- (i) Find the distance between the towers $P(0,7.5)$ and $Q(-15,15)$.
- (ii) Find the distance of the point $S(5,25)$ from x -axis.
- (iii) Find the point on x -axis (other than O) equidistant from the points $R(0,-5)$ and $M(0,5)$.
- (iv) There are two trees $T_1(-5,7)$ and $T_2(-1,3)$ in the park. Find the coordinates of the mid-point of the line segment joining both the tree

159. The class IX was divided into two groups for discussion on the topic of Coordinate Geometry. Both the groups had prepared lots of questions and their answers. Some parts of the questions are shown here. So you are required to

answer them.

1. The coordinates of the point which lies on x-axis at a distance of 4 units in the negative direction of x-axis is

(i) (0,4) (ii) (4,0) (iii) (-4,0) (iv) (0,-4)

2. The quadrants in which abscissa and ordinate are equal are

(i) I and II quadrants (ii) II and III quadrants

(iii) I and III quadrants (iv) III and IV quadrants

3. Which one of the following is the sign of abscissa and ordinate of a point in the third quadrant respectively?

4. On plotting the points $O(0,0)$, $A(4,0)$, $B(4,4)$, $C(0,4)$, and joining OA, AB, BC and CO which of the following figures is obtained?

160. On Parents-Teacher (PT) meeting day, maths teacher made a complain against Rahul to his parents that Rahul is not fair in mathematics particularly on the topics Coordinate Geometry. Rahul could not object his teacher. He simply smiled and requested his teacher to give him a test paper to solve in front of his parents. The teacher gave a test paper to Rahul and asked him to solve it quickly and return him. The questions in the test paper are as follows:

1. A point lies on x-axis at a distance of 6 units from the y-axis. Its coordinates are

(i) (0,6) (ii) (6,0) (iii) (-6,0) (iv) (0,-6)

2. The name of the figure obtained by joining the points $P(-6,2)$, $Q(-6,0)$, $R(0,0)$ and $S(0,2)$ is

(i) Rectangle (ii) Rhombus (iii) Square (iv) Trapezium

3. Find the coordinates of a point whose ordinate is -5 and which lie on y-axis.

4. Find the coordinates of a point whose abscissa is -6 and which lie on x-axis.

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