Grade IX

Lesson :3 [COORDINATE GEOMETRY]

Objective Type Questions

I. Multiple choice questions

1. The point (0, 5) lies

   a) on the x-axis b) on the y-axis

   c) in the II quadrant d) in the I quadrant

   Sol : (b)

2. A point which lies in third quadrant have sign

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

   Sol : (d)

3. Does the line y = x pass through origin?

   a) yes b) no

   Sol: The coordinates of the origin are (0,0). Putting this in they line y = x, we have

   0 = 0, which is true

   $\therefore Correctoption\ is\ (a)$

4. If coordinate of a point is zero, then this point always lies [NCERT Exemplar]

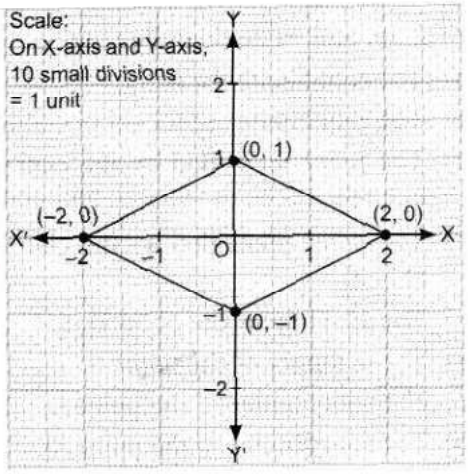
   a) in I quadrant b) in II quadrant c) on x-axis d) on y-axis

   Sol : (c)

5. If we join the points (-2,0) (0,1), (2,0) and (0,-1), then name the figure formed.

a) square b) rectangle c) rhombus d) trapezium

Sol :



Clearly, the figure formed is rhombus

$\therefore Correctoption\ is\ (c)$

6.The equation of x-axis is

a) x = 0 b) y = 0, c) x = 0, y = 0 d) none of these

Sol : (b)

7. The ordinate of the point (4, -5) is

a) 4 b) 5 c) -5 d) none of these

Sol : (c)

8. The point (2,4) lies in the quadrant

a) I b) II c) III d) IV

Sol : (a)

9. Abscissa of all the points on the x-axis is [NCERT Exemplar]

a) 0 b) 1 c) 2 d) any number

Sol : (d)

10. If the perpendicular distance of a point from x-axis is 7 units and foot of the perpendicular lies on the negative direction of x-axis, then the point has

a) x - coordinate = -7

b) y - coordinate = 7 only

c) y - coordinate = -7 only

d) y - coordinate = 7 or -7

Sol. We know that the perpendicular distance of a point from x-axis gives y-coordinate of that point. Also the foot of the perpendicular lies on the negative direction of x-axis. So, the perpendicular distance can be measured in the second or third quadrant, Hence, the point has y – coordinate = 7 or -7

∴Correction option is (d)

11. While writing the coordinates of a point, which coordinate comes first: y-coordinate or x-coordinate? [CBSE 2014]

Sol. x - coordinate?

12. A policeman and a thief are equidistant from the jewel box, Upon considering jewel box as origin, the position of policeman is (0,5), If the ordinate of the position of thief is zero, then write the coordinates of the position of thief. [CBSE 2013]

Sol : Since both policeman and thief are equidistant from the jewel box (origin), so coordinates of the position of thief are (5.0), or (-5,0)

13. Write two points lying on the x-axis, which are at equal distances from the origin, [CBSE 2014]

Sol : P(5,0) and Q(-4,0) or P (5,0) and Q (-5,0)

Note : Answer may differ

14. If (a, b) = (0, 22), then find the value of a and b, [CBSE 2016]

Sol . Here the ordered pairs are equal

∴ a = 0 and b = 22

15. What do you mean by the ordinate of a point? [CBSE 2015]

Sol : Ordinate of a point is equal to the perpendicular distance from the x-axis measured along the y-axis.

16. In which quadrant, the points P(2, -3) and Q (-3,2) lie?

Sol : P(2,-3) live in IVth quadrant and Q(-3, 2) lies in IInd quadrant.

17. Find the perpendicular distance of the point P(5,7) from the y-axis [CBSE 2016]

It is equal to 5 units

18. The point P(a,b) lies in the IVthquadrant. Which is greater: a or b?

[CBSE 2016]

It is equal to 5 units

19. The point P (a, b) lies in the IV the quadrant, which is greater a or b? [CBSE 2016]

In the IVth quadrant, abscissa (x - coordinate) is positive and ordinate (y - coordinate) is negative. Hence, abscissa>ordinate, i.e. a > b.

19. Write any two points lying in the second quadrant. [CBSE 2014]

Sol : P (-4, 5), Q (-3, 8),

Note : Answer may be differ

20. Write the coordinate of a point whose abscissa is – 7 and ordinate is 2.

Sol : (-7, 2) as abscissa represents x-coordinate, while ordinate is y – coordinate.

I. SHORT ANSWER TYPE

1. In which quadrant, will the point lies, if [CBSE 2014]

i. the ordinate is 2 and the abscissa is – 3

ii. the abscissa is - 4 and the ordinate is – 2

iii. the ordinate is -3 and the abscissa is 4

iv. the ordinate is 3 and the abscissa is – 2

Sol : i. Here abscissa is negative and ordinate is positive, so the point is (-3, 2). Hence it lies in IInd quadrant.

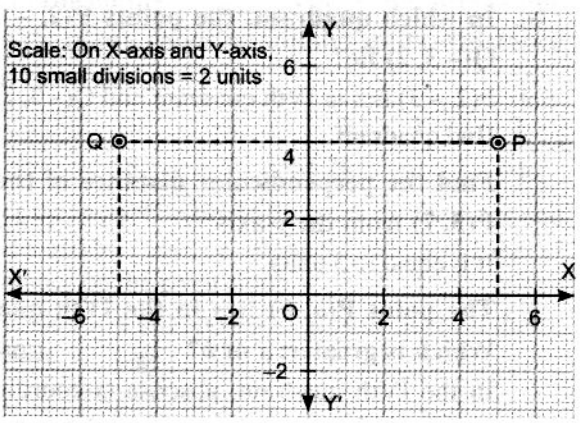
ii. Here abscissa and ordinate both are negative, the point is (-4, -2). Which lies in IIIrd quadrant.

iii. Here abscissa is positive and ordinate is negative. Therefore, the point is (4, -3). lies in IVth quadrant.

iv. Here abscissa is negative and ordinate is positive. Therefore, the point (-2, 3) lies in IInd quadrant.

2. A point is at a distance of 4 units from the x-axis and 5 units from the y-axis. Represent the position of the point in the Cartesian plane and also write its coordinates [CBSE 2015]

Sol :



The position of point is shown in the above graph. Two points are observed in the Cartesian plane, Hence, coordinates of points are P(5, 4) and Q (-5, 4) respectively.

3. If the coordinates of two points are P(-2, 3) and Q(-3, 5), then find (abscissa of P) - (abscissa of Q) **[CBSE 2016]**

Sol : The abscissa (x-coordinate) of point P is (-2) and that of Q is (-3)

∴(Abscissa of P) – (abscissa of Q) = (-2) – (-3) = -2 + 3 = 1 unit

4. Find the distance of the following points from the y-axis P(3,0),Q(0,-3), R(22,-5), S(-3,-1).

Sol : Distance of the point from the y-axis is the x – coordinate of the given point, So, the distances of points P,Q,R and S from the y-axis and 3 units, 0 unit, 22 units and -3 units (negative sign indicates that the distance is measured along negative x-axis)

II. SHORT ANSWER TYPE

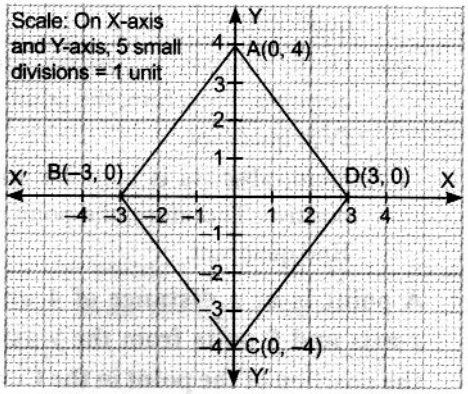
5. (i) Plot the points A (0,4), B (-3,0), C (0,-4), D (3,0),

(ii) Name the figure obtained by joining the points A,B, C and D.

(iii) Also, name the quadrants in which sides AB and AD lie. [CBSE-2011]

Sol :

(i)

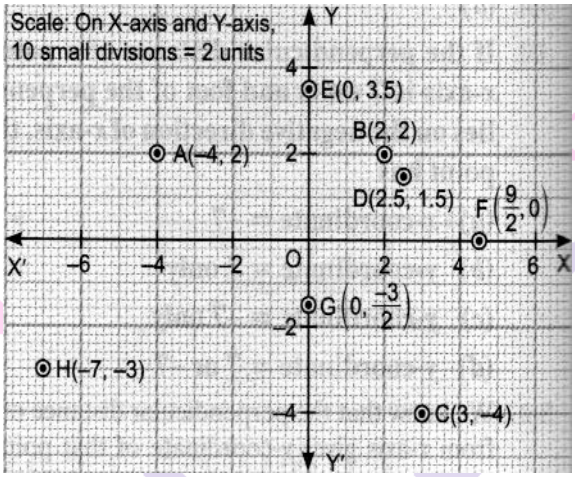


(ii) Rhombus

(iii) IInd ,Ist

6. Locate the points A (-4, 2), B(2,2), C(3,-4), D(2.5, 1.5) E(0, 3.5) $F\left(\frac{9}{2},0\right)$, G $\left(0,\frac{-3}{2},\right)$ and H (-7, -3) in the Cartesian plane.

Sol:



7. Write the coordinates of the following points,

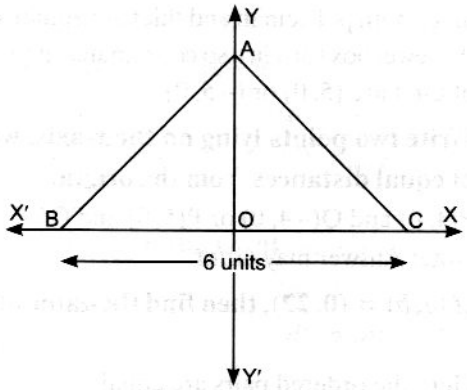
(i) lying on neither axes at a distance of 3 units from the x-axis and 5 units from the y-axis

(ii) lying on y-axis with the y-coordinate (-3)

(iii) lying on the x-axis with x-coordinate 4.

Sol: (i) (5,3) (ii) (0,-3) (iii) (4,0)

8. Point A is chosen on y-axis in such a way that ΔABC is an equilateral triangle. The base BC of the ΔABC is shown in the figure. Find the coordinates of (i) the mid-point of BC (ii) the area of the triangle (iii) the vertices of a triangle. [HOTS]



Sol: i) O is the mid-point of BC, but lies at the intersecting point of the coordinates axis Hence, coordinates of mid-point of BC is (0,0)

(ii) Given ΔABC is an equilateral triangle

AB = BC = CA = 6 Units

O is the perpendicular bisector of BC

$\therefore$ OB = $\frac{1}{2}$BC = $\frac{1}{2}$x 6 = 3 units

Using Pythagoras theorem, in right – angled ΔAOB with ∠O = 90^0, we have

$AB^2 = OB^2 + AO^2$

$\Rightarrow$ $AO^2 = AB^2 - OB^2$

$=6^2 - 3^2 = 36 - 9 = 27$

$\therefore$ AO = $\sqrt{27}$= $3\sqrt{3}$ Units

So, area of ΔABC = $\frac{1}{2}$ x Base x Altiude

= $\frac{1}{2}$ x BC x AO

= = $\frac{1}{2}$ x 6 x 3 $\sqrt{3}$

= 9 $\sqrt{3}$ $sq.units$

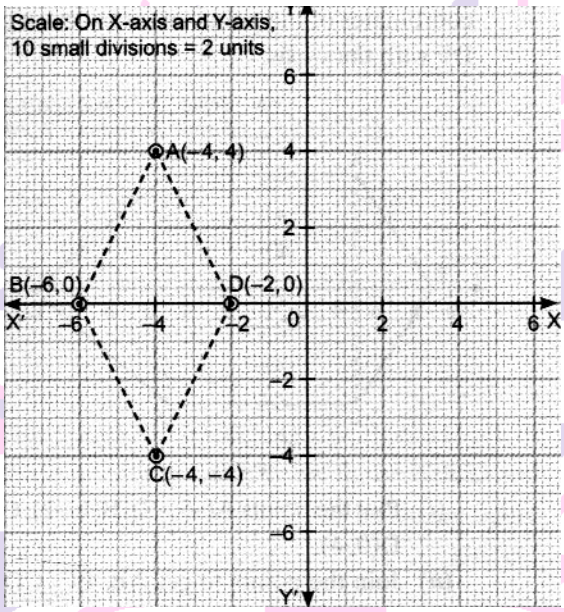
(iii) The coordinates of vertices of ΔABC are A(0, 3 $\sqrt{3}$), B(-3, 0),and C(3,0).

I. LONG ANSWER TYPE

1. (i) Plot the following points in the coordinate plane : A(-4,4), B(-6,0), C(-4,-4),D(-2,0),

(ii) Name the figure formed by joining the points A, B, C and D also find its area.

Sol. (i)



(ii) Rhombus

Area of rhombus ABCD

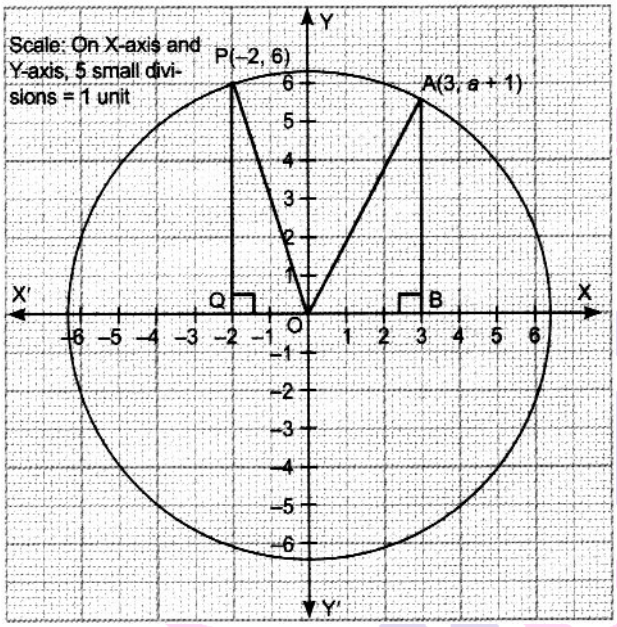
$= \frac{1}{2}$ x (Product of its two diagonals)

$= \frac{1}{2} \times BD \times AC$

$= \frac{1}{2} \times 4 \times 8 = 16$ sq.units

2. Given area (ΔOAB) = area (ΔOPQ). Find the ordinate of point A

[CBSE 2011, HOTS]



Sol : Coordinates of point P are (-2,6)

∴ In ΔOPQ, OQ = 2 units and

PQ = 6 units

In ΔOAB, OB = 3 units

and AB = (a+1) units

Given: area (ΔOAB) = area (ΔOPQ)

$\Rightarrow \frac{1}{2} \times OB \times AB = \frac{1}{2} \times OQ \times PQ$

[Area of triangle = $\frac{1}{2} \times base \times height$]

$\Rightarrow \frac{1}{2} \times 3 \times (a+1) = \frac{1}{2} \times 2 \times 6 = 6$

$\Rightarrow a + 1 = \frac{6 \times 2}{3} = 4$

∴ Ordinate of point A = a + 1 = 4