CHAPTER

3

COORDINATE GEOMETRY

MATHEMATICAL REASONING

1. The linear equation $y = 2x + 3$ cuts the y-axis at _____.

(A) (0, 3) (B) (0, 2)

(C) $\left(\frac{3}{2},0\right)$ (D) $\left(\frac{2}{3},0\right)$

2. (2, 1) is a point, which belongs to the line _____.

(A) $x = y$ (B) $y = x + 1$

(C) $2y = x$ (D) $xy = 1$

3. One set of ordered pair which belongs to a straight line represented by an equation $y = 2x - 1$ is _____ .

(A) (1, 1) (B) (2, 1)

(C) (1, 2) (D) (3, 1)

4. The axis on which the point (0, – 4) lie, is _____.

(A) Positive x-axis

(B) Negative x-axis

(C) Positive y-axis

(D) Negative y-axis

5. The coordinate axes divide the plane into _____.

(A) One part (B) Two parts

(C) Three parts (D) Four parts

6. If $(x + 3, 5) = (2, 2 - y)$ then the values of the x and y respectively are

(A) 5, 3 (B) –1, –3

(C) 0, –3 (D) 1, 3

7. The value of 'x' in the ordered pair $(x, -8)$ if the ordinate of the pair is 4 more than the abscissa is _____.

(A) – 4 (B) – 8

(C) – 12 (D) 4

8. The point (–5, 6) lies in

(A) Ist quadrant

(B) IInd quadrant

(C) IIIrd quadrant

(D) IVth quadrant

9. The point at which the two coordinate axes meet is called _____.

(A) Abscissa (B) Ordinate

(C) Origin (D) Quadrant

10. The coordinates of two points are $A(3, 4)$ and $B(-2, 5)$, then (abscissa of A) – (abscissa of B) is_____.

(A) 1 (B) –1

(C) 5 (D) –5

11. The signs of abscissa and ordinate of a point in quadrant II are respectively _____.

(A) (+, –) (B) (–, +)

(C) (–, –) (D) (+, +)

12. Two points having same abscissa but different ordinates lie on _____.

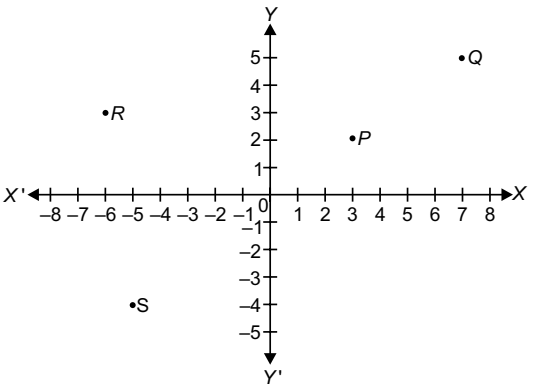
(A) x-axis

(B) y-axis

(C) A line parallel to y-axis

(D) A line parallel to x-axis

DIRECTION (13-16): Study the graph and answer the following questions.



13. The coordinate of point *S* are _____.
(A) (4, 5) (B) (–5, –4)
(C) (–4, –5) (D) (5, 4)

14. Sum of abscissae of point *P* and *R* is _____.
(A) 5 (B) 6
(C) 9 (D) –3

15. The point whose abscissae is 2 more than the ordinate is _____.
(A) *P* (B) *R*
(C) *Q* (D) *S*

16. The difference between ordinates of *R* and *Q* is _____.
(A) 8 (B) 3 (C) 2 (D) 14

17. The area of the triangle formed by the points *P* (0, 1), *Q* (0, 5) and *R* (3, 4) is _____.
(A) 16 sq. units (B) 8 sq. units
(C) 4 sq. units (D) 6 sq. units

18. The perpendicular distance of the point (–7, 8) from the *x*-axis is _____.
(A) 7 (B) 8
(C) –7 (D) 1

19. The point (3, 0) lies _____.
(A) On *x*-axis (B) On *y*-axis
(C) In I quadrant (D) None of these

20. The signs of the abscissa and ordinate of a point in the fourth quadrant respectively are_____.
(A) +, + (B) –, –
(C) +, – (D) –, +

ACHIEVERS SECTION (HOTS)

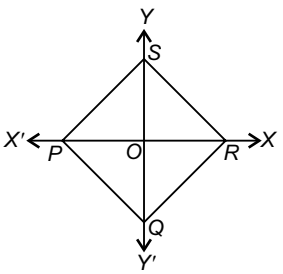
21. State 'T' for true and 'F' for false.
(i) Origin is the only point which lies on both the axes.
(ii) The point (2, –2) and point (–2, 2) lies in the same quadrant.
(iii) A point lies on *y*-axis at a distance 2 units from *x*-axis then it's coordinates are (2, 0).
(iv) Abscissa of a point is positive in I quadrant and also in II quadrant.

	(i)	(ii)	(iii)	(iv)
(A)	F	T	F	T
(B)	T	F	F	F
(C)	F	T	T	F
(D)	T	F	T	F

22. Fill in the blanks.
(i) Point *B* is 3 spaces right and one space above from the point *A*(–1, –2). So point *B* lies in quadrant **P** .
(ii) Point *B* is 40 spaces left and 0.02 spaces above from the point *A*(20, 0.18). So point *B* lies in quadrant **Q** .
(iii) Point *B* is 15 spaces right and 15 spaces below from the point *A* (–15, 0). So, coordinate of point *B* are **R** .
(iv) A man moves 30 metres towards North and then moves 50 metres towards South and finally 10 metres towards East. Considering his initial position at origin, the coordinate of his final destination are **S** .

	P	Q	R	S
(A)	II	I	(0, 15)	(–10, 20)
(B)	IV	II	(0, – 15)	(10, – 20)
(C)	II	IV	(10, – 20)	(0, – 15)
(D)	I	II	(0, 15)	(10, 20)

23. In the given figure, *PQRS* is a rhombus whose diagonal *PR* and *QS* are along coordinate axis and *PR* = 12 units and *QS* = 6 units. Now, if *T* is a point which is 5 spaces right and 2 spaces above *S*. Find :

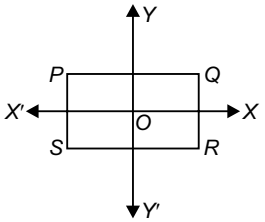


(i) sum of abscissae of *P* and *T*.

(ii) sum of ordinates of *Q*, *R* and *T*.

	(i)	(ii)
(A)	–1	2
(B)	1	–2
(C)	1	2
(D)	–1	–2

24. In the given figure, *PQRS* is a rectangle with its centre at origin and length *PQ* = 2*a* units and breadth *QR* = 2*b* units. Find coordinates of all of its vertices.



(A) *P*(*a*, – *b*), *Q*(*a*, *b*), *R*(–*a*, *b*), *S*(–*a*, –*b*)

(B) *P*(*a*, – *b*), *Q*(*a*, *b*), *R*(*a*, – *b*), *S*(–*a*, –*b*)

(C) *P*(–*a*, *b*), *Q*(*a*, *b*), *R*(*a*, – *b*), *S*(–*a*, – *b*)

(D) *P*(–*a*, *b*), *Q*(*a*, *b*), *R*(*a*, – *b*), *S*(–*a*, *b*)

25. Match the following.

	Column-I	Column-II
(P)	The area of ΔOAB with $O(0, 0)$, $A(4, 0)$ and $B(0, 8)$ is	(i) 14 sq. units
(Q)	The area of ΔABC with $A(2, 0)$, $B(6, 0)$ and $C(4, 6)$ is	(ii) 16 sq. units
(R)	The area of ΔOAB with $O(0, 0)$, $A(7, 0)$ and $B(0, 4)$ is	(iii) 12 sq. units

(A) (P) → (ii), (Q) → (i), (R) → (iii)

(B) (P) → (iii), (Q) → (i), (R) → (ii)

(C) (P) → (iii), (Q) → (ii), (R) → (i)

(D) (P) → (ii), (Q) → (iii), (R) → (i)

HINTS & EXPLANATIONS

3 Coordinate Geometry

1. (A) : The equation is $y = 2x + 3$ cuts the y-axis at (0, 3). Because on y-axis, $x = 0 \Rightarrow y = 2 \times 0 + 3 \Rightarrow y = 3$

2. (C) : (2, 1) is a point, which satisfies the eq. of line $2y = x$. So it belongs to the line $2y = x$.

3. (A) : We have, $y = 2x - 1$
On putting $y = 1$, we get, $1 = 2x - 1 \Rightarrow x = 1$
$\therefore$ Coordinates = (1, 1)

4. (D) : Since x-coordinate is 0, therefore the given point lies on y-axis. Also, y-coordinate is negative. So, it lies on negative y-axis.

5. (D)

6. (B) : Since $(x + 3, 5) = (2, 2 - y)$
$\Rightarrow x + 3 = 2 \Rightarrow x = 2 - 3 = -1$

and $2 - y = 5 \Rightarrow 2 - 5 = y \Rightarrow y = -3$
$\therefore x = -1, y = -3$

7. (C) : According to question,
$x = -8 - 4 = -12$

8. (B) : Point (–5, 6) represent negative of x-coordinate and positive of y-coordinate.
$\therefore$ It lies in IInd quadrant.

9. (C) : The two coordinate axes meet at the origin.

10. (C) : (Abscissa of A) – (abscissa of B) = 3 – (–2) = 5

11. (B) 12. (C)

13. (B) : Coordinates of point S are (–5, –4).

14. (D) : Abscissa of point $P = 3$
Abscissa of point $R = -6$
$\therefore$ Required sum = 3 – 6 = –3

15. (C) : Coordinates of point Q are (7, 5) which represents the abscissa is 2 more than the ordinate.

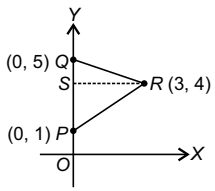
16. (C) : Coordinates of R (–6, 3) and Q (7, 5)
$\therefore$ Required difference = 5 – 3 = 2

17. (D) : Area of triangle PQR

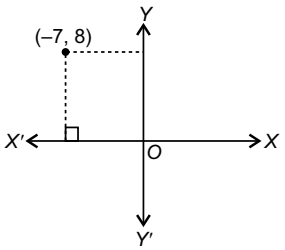
$= \frac{1}{2} \times PQ \times RS$

$= \frac{1}{2} \times (4) \times (3)$

= 6 sq. units



18. (C) : Perpendicular distance of point (–7, 8) from the x-axis is –7.



19. (A)

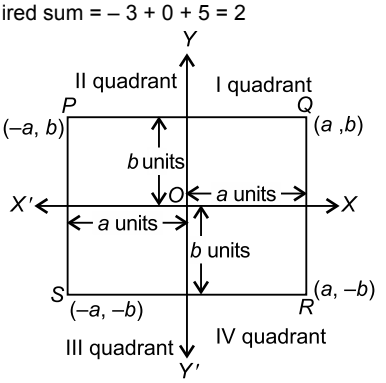
20. (C) : Abscissa are positive and ordinates are negative in fourth quadrant.
$\therefore$ Signs in fourth quadrant are (+, –).

21. (B) : (i) Origin is the point where both the axes meet.
(ii) Point (2, –2) lies in IV quadrant.
And point (–2, 2) lies in II quadrant.
(iii) A point lies on y-axis at a distance 2 units from x-axis has it's coordinates are (0, 2).
(iv) Abscissa of a point is positive in I quadrant and negative in II quadrant.

22. (B) : (i) Coordinate of point B are (2, –1).
$\therefore$ Point B lies in IV quadrant.
(ii) Coordinate of point B are (–20, 0.20).
$\therefore$ Point B lies in II quadrant.
(iii) Coordinate of point B are (0, –15).
(iv) Coordinates of his final destination are (10, – 20).

23. (A) : From the given information,
Coordinates of point T are (5, 5).
(i) Abscissa of $P = -6$.
Abscissa of $T = 5$
$\therefore$ Required sum = – 6 + 5 = – 1.
(ii) Ordinate of $Q = -3$
Ordinate of $R = 0$
Ordinate of $T = 5$
$\therefore$ Required sum = – 3 + 0 + 5 = 2

24. (C) :



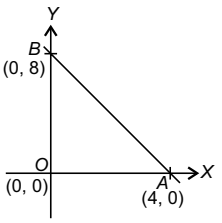
Hence, coordinates are, $P(-a, b)$, $Q(a, b)$, $R(a, -b)$, and $S(-a, -b)$.

25. (D) : (P) Area of ΔOAB

$= \frac{1}{2} \times OA \times OB$

$= \frac{1}{2} \times 4 \times 8$

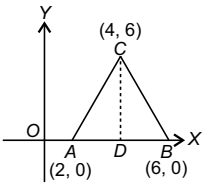
= 16 sq. units



(Q) Area of ΔABC

$= \frac{1}{2} \times 4 \times 6$

= 12 sq. units



(R) Area of ΔOAB

$= \frac{1}{2} \times 7 \times 4$

= 14 sq. units