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SOLUTIONS: COORDINATE GEOMETRY

Mathematics | Class IX (2026/COORGD/09/002)

Section A (Multiple Choice Questions)

1. (a) **II and IV quadrants.** In Quadrant II, coordinates are of form $(-x, x)$. In Quadrant IV, they are $(x, -x)$.
2. (b) $a < 0, b > 0$. In the II quadrant, the abscissa is negative and the ordinate is positive.
3. (a) **7 units.** Distance from Y-axis is the absolute value of the x-coordinate: $|-7| = 7$.
4. (b) **(0, 4).** A point on the Y-axis must have an abscissa (x) of 0.
5. (c) **6 sq. units.** Area = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 4 \times 3 = 6$.
6. (d) **(-1, 0).** Distances from origin: (a) 2, (b) 3, (c) $\sqrt{2} \approx 1.41$, (d) 1. Point $(-1, 0)$ is closest.
7. (b) $x - y = 0$. If $(x, y) = (y, x)$, then $x = y$, which implies $x - y = 0$.
8. (b) **Rectangle.** Length is 3 units and breadth is 4 units. Adjacent sides are perpendicular.

Section B (Very Short Answer Questions)

1. 9 units from Y-axis means $|x| = 9$. Negative side of X-axis means $x = -9$. Since it lies on X-axis, $y = 0$. Coordinates: **(-9, 0)**.
2. (i) Reflection in X-axis: $(x, -y) \rightarrow$ **(-3, -5)**.
(ii) Reflection in Origin: $(-x, -y) \rightarrow$ **(3, -5)**.
3. Both points lie on the Y-axis. The vertical distance is $6 - (-2) = 8$ units. The mid-point is 4 units from either point. $6 - 4 = 2$ or $-2 + 4 = 2$. Coordinates: **(0, 2)**.
4. $M(3, -4)$. P is on X-axis directly above/below $M \rightarrow$ **P(3, 0)**. Q is on Y-axis directly left/right of $M \rightarrow$ **Q(0, -4)**.

Section C (Short Answer Questions)

1. Plotting $A(1, 3), B(1, -1), C(5, -1)$.
Distance $AB = 4$ units (vertical), $BC = 4$ units (horizontal). To form square $ABCD$, D must be 4 units above C and 4 units right of A . Coordinates: **D(5, 3)**.
2. Base is $2a$, origin is mid-point. Vertices on X-axis: **(-a, 0)** and **(a, 0)**.
Height $h = \sqrt{(2a)^2 - a^2} = \sqrt{3}a$. Third vertex on Y-axis: **(0, $\sqrt{3}a$)** or **(0, $-\sqrt{3}a$)**.
3. From the diagram:
Abscissa of $L(-2, 4)$ is **-2**.
Ordinate of $M(0, -2)$ is **-2**.
Point $N(3, 0)$ lies on the **Positive X-axis**.

Section D (Long Answer Questions)

- (i) [Plotting $A(5, 3), B(-2, 3), D(5, -4)$].

(ii) AB is a horizontal side of length $|5 - (-2)| = 7$. AD is a vertical side of length $|3 - (-4)| = 7$. C must be at $(-2, -4)$. **C(-2, -4)**.

(iii) Area = side² = $7 \times 7 = 49$ sq. units.
- (i) & (ii) $P(-1, 0), Q(2, 0), R(2, 3)$ form a right-angled triangle.

(iii) Reflection in Y-axis changes the sign of the x-coordinate:
 $P' = (1, 0), Q' = (-2, 0), R' = (-2, 3)$.

Section E (Case Study Based Question)

- (c) **Quadrant III**. Both coordinates in $B(-4, -2)$ are negative.
- (a) **(2, -2)**. $S(2, 3)$ and $G(-4, 3)$ share a y-coordinate. $B(-4, -2)$ shares an x-coordinate with G . T must share an x-coordinate with S (2) and a y-coordinate with B (-2).
- (b) **5 units**. Distance = $|3 - (-2)| = 5$ units (vertical distance).
- (b) **3**. The ordinate is the y-coordinate.
- (b) **Gold Ornament G**. 3 left, 2 up is $(-3, 2)$. G is at $(-4, 3)$, which is closer than $S(2, 3)$ or $B(-4, -2)$.