SOLUTIONS

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SOLUTIONS: COORDINATE GEOMETRY

Section A (Multiple Choice Questions)

1. **(b) I and IV quadrants.** The abscissa (x-coordinate) is positive to the right of the Y-axis.

2. **(b) On the Y-axis.** Since the x-coordinate is 0, the point lies on the Y-axis.

3. **(b) 3 units.** Distance from X-axis = $|y\text{-coordinate}| = |3| = 3$.

4. **(a) (a, a).** On the line $y = x$, the x and y coordinates are always equal.

5. **(d) (0, 0).** The origin is the reference point where axes cross.

6. **(b) II quadrant.** Coordinates $(-3, 2)$ follow the pattern $(-, +)$.

7. **(c) On X-axis.** If $y = 0$, the point has no vertical displacement from the X-axis.

8. **(d) (-, -).** In the III quadrant, both x and y are negative.

Section B (Very Short Answer Questions)

1. Length = 5 (on X-axis), Breadth = 3. In IV quadrant (x pos, y neg). Vertices: **(0, 0), (5, 0), (5, -3), (0, -3)**.

2.
   - $(-2, 4)$: **II Quadrant**
   - $(3, -1)$: **IV Quadrant**
   - $(-1, 0)$: **X-axis** (negative side)
   - $(1, 2)$: **I Quadrant**

3. Distance from X-axis $= |y| = 4$; Distance from Y-axis $= |x| = 3$. Possible coordinates: **(3, 4), (-3, 4), (-3, -4), (3, -4)**.

4. Point on Y-axis $\implies$ Abscissa = 0. $k - 1 = 0 \implies$ **k = 1**. Substituting $k = 1$ in P: $P(1 - 1, 1 + 2) = \mathbf{P(0, 3)}$.

Section C (Short Answer Questions)

1. On plotting $A(2, 2), B(-2, 2), C(-2, -2), D(2, -2)$ and joining them: The length $AB = 4$ units and $BC = 4$ units. Since all sides are equal and axes are perpendicular, the figure formed is a **Square**.

2. M is on X-axis with abscissa $-5 \implies$ **M(-5, 0)**. N is on Y-axis with ordinate 5 $\implies$ **N(0, 5)**. Area of $\triangle MON = \frac{1}{2} \times \text{Base} \times \text{Height} = \frac{1}{2} \times |-5| \times |5| = \mathbf{12.5}$ sq. units.

3. From the graph: **P(2, 3), Q(-3, 1), R(-2, -3), S(3, -2)**.

Section D (Long Answer Questions)

1. **Plotting:** $P(1,1), Q(2,4), R(3,1)$. (i) Since $P(1,1)$ and $R(3,1)$ are on the same horizontal line and Q is symmetric between them, it forms an **Isosceles Triangle**. (ii) Reflection of $Q(2,4)$ in X-axis: Change sign of $y \implies (\mathbf{2, -4})$. (iii) Reflection of $P(1,1)$ in Y-axis: Change sign of $x \implies (\mathbf{-1, 1})$.

2. **Square vertices:** $A(1,4), B(-3,4), C(-3,0)$. (i) Distance $AB = |1-(-3)| = 4$ units. Distance $BC = |4-0| = 4$ units. (ii) To complete the square, D must be 4 units right of $C(-3,0)$ and 4 units below $A(1,4)$. Coordinates of **D: (1, 0)**. (iii) Intersection of diagonals is the midpoint of AC: $M = \left(\frac{1+(-3)}{2}, \frac{4+0}{2}\right) = (\mathbf{-1, 2})$.

Section E (Case Study Based Question)

1. **(d) Commercial Zone.** Point $M(5, -3)$ is $(+, -)$, which is Quadrant IV.

2. **(b) -3.** The abscissa is the x-coordinate of $F(-3, 2)$.

3. **(c) Public Library.** $L(-2, -4)$ has both coordinates negative (Quadrant III).

4. **(b) (0, 5).** "On North-South Avenue" means X=0. "Height of 5 units" means Y=5.

5. **(b) 5 units.** Distance from X-axis is the absolute value of the y-coordinate $|5|$.