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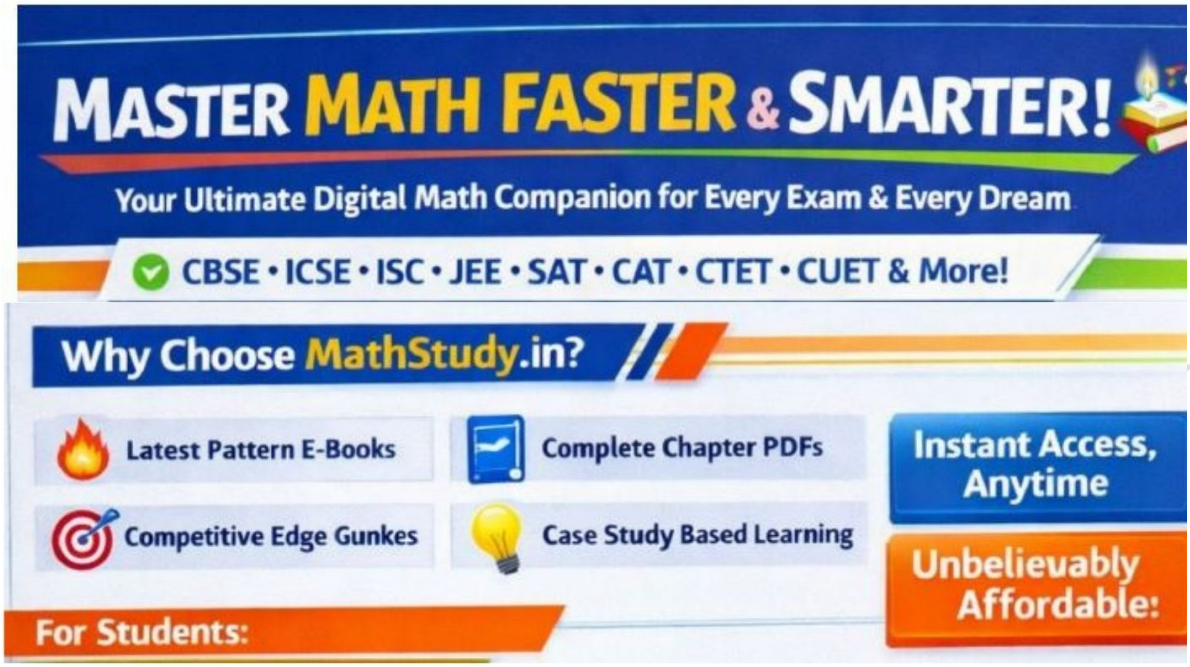

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SOLUTIONS: COORDINATE GEOMETRY

~~**Mathematics | Class IX (2026/COORGD/09/003)**~~

Section A (Multiple Choice Questions)

1. **(b) I or III quadrant.** If $xy > 0$, both x and y must have the same sign (both positive in Q I or both negative in Q III).

2. **(d) The line $y = -x$.** For any point $(a, -a)$, the y-coordinate is the negative of the x-coordinate.

3. **(c) 0.** Every point on the X-axis has the form $(x, 0)$.

4. **(b) II and III quadrants.** The x-coordinate (abscissa) is negative to the left of the Y-axis.

5. **(b) Q and R.** Fourth quadrant points have the sign $(+, -)$. $Q(3, -4)$ and $R(1, -1)$ satisfy this.

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

7. **(a) (-3, 0).** A point on the X-axis has $y = 0$; the abscissa is given as -3.

8. **(c) 24 sq. units.** Base = 8 units (on X-axis), Height = 6 units (on Y-axis). Area = $\frac{1}{2} \times 8 \times 6 = 24$.

Section B (Very Short Answer Questions)

1. The foot of the perpendicular is at $(-3, 0)$ (negative X-axis, 3 units from origin). The distance of P from X-axis is 5 units. This means $y = 5$ or $y = -5$. Coordinates of P: **(-3, 5) or (-3, -5)**.

2. Points $A(4, 4)$ and $B(-4, 4)$ are plotted. OA and OB are equal. AB is a horizontal line. The figure OAB is an **Isosceles Triangle**.

3. (i) Abscissa 5, Ordinate $-1/2 \implies (\mathbf{5}, \mathbf{-0.5})$.
   (ii) Abscissa $-3/2$, on X-axis $(y = 0) \implies (\mathbf{-1.5}, \mathbf{0})$.

4. The point is the **Origin (0, 0)**. It is unique because it is the only point where the horizontal displacement and vertical displacement from the reference axes are both zero.

Section C (Short Answer Questions)

1. **Collinearity:** Plotting $(1, 1), (2, 2), (4, 4)$ shows they lie on a straight line.
   Justification: For every point, $y = x$. This linear relationship indicates that they are part of the same line passing through the origin.

2. $P(2, 3) \xrightarrow{\text{X-axis reflection}} P'(2, -3)$.
   $P'(2, -3) \xrightarrow{\text{Y-axis reflection}} P''(-2, -3)$.
   P'' has $(-, -)$ signs, so it lies in the **III Quadrant**.

3. From the provided figure:

- **A:** Lies on negative X-axis at 2 units $\implies (\mathbf{-2}, \mathbf{0})$.
- **B:** Lies on positive Y-axis at 3 units $\implies (\mathbf{0}, \mathbf{3})$.
- **C:** Lies on positive X-axis at 2 units $\implies (\mathbf{2}, \mathbf{0})$.
- **D:** Lies on negative Y-axis at 3 units $\implies (\mathbf{0}, \mathbf{-3})$.

Section D (Long Answer Questions)

1. **Plotting:** $A(-2,3), B(4,3), C(4,-2), D(-2,-2)$. (i) $AB = |4-(-2)| = 6$ units. $BC = |3-(-2)| = 5$ units. Opposite sides are equal and angles are $90°$. It is a **Rectangle**. (ii) Perimeter $= 2(L+B) = 2(6+5) =$ **22** units. (iii) Mid-point of $AB = \left(\frac{-2+4}{2}, 3\right) = (\mathbf{1}, \mathbf{3})$.

2. (i) & (ii) $L(0,2), M(3,2), N(0,5)$ form a right-angled triangle. (iii) Base $LM = 3$ units, Height $LN = |5-2| = 3$ units.
   Area $= \frac{1}{2} \times 3 \times 3 =$ **4.5** sq. units. (iv) Shifting 2 units right adds 2 to the x-coordinate. New $M = (3+2, 2) = (\mathbf{5}, \mathbf{2})$.

Section E (Case Study Based Question)

1. **(c) (0, -5).** On Y-axis (x=0) and 5 units below origin (y=-5).

2. **(b) Y-axis.** $JetA(6,8)$ and $JetB(-6,8)$ have the same y-value but opposite x-values.

3. **(b) -6.** The x-coordinate of Jet B.

4. **(b) Quadrant III and IV.** Jet A is in Q I $(+,+)$ and Jet B is in Q II $(-,+)$.

5. **(b) (0, 0).** The rectangular zone is centered at the origin as it extends equally (± 2) in all directions.