

Assertion and Reason Questions on Orienting Yourself - The Use of Coordinates for Class 9

Directions: In each question below, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option:

- (a) Both A and R are true, and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Q1: Assertion (A): The point (3, 0) lies on the x-axis.

Reason (R): Any point whose y-coordinate is zero lies on the x-axis.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because the point (3, 0) has $y = 0$, so it lies on the x-axis. R is also true and correctly explains that any point with $y = 0$ lies on the x-axis.

Hence, (a) is correct.

Q2: Assertion (A): The origin has coordinates (0, 0).

Reason (R): The origin is the point where the x-axis and y-axis intersect each other.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because the origin is (0, 0). R is also true since the origin is where both axes meet and both coordinates are zero. R correctly explains A, so (a) is correct.

Q3: Assertion (A): The point (-4, 5) lies in the second quadrant.

Reason (R): In the second quadrant, the x-coordinate is negative and the y-coordinate is positive.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because (-4, 5) has x negative and y positive, so it lies in Quadrant II. R is also true as it states the correct rule for Quadrant II. R correctly explains A, so (a) is correct.

Q4: Assertion (A): The point $(6, -2)$ lies in the third quadrant.

Reason (R): In the third quadrant, both x and y coordinates are negative.

Answer: (d) A is false but R is true.

Explanation: A is false because $(6, -2)$ lies in Quadrant IV, not Quadrant III. R is true as it correctly defines Quadrant III ($x < 0, y < 0$). Hence, (d) is correct.

Q5: Assertion (A): The point $(0, -7)$ lies on the y -axis.

Reason (R): A point lies on the y -axis if and only if its x -coordinate is zero.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because $(0, -7)$ has $x = 0$, so it lies on the y -axis. R is also true since any point with $x = 0$ lies on the y -axis. R correctly explains A, so (a) is correct.

Q6: Assertion (A): The distance of the point $(-5, 12)$ from the origin is 13 units.

Reason (R): The distance of any point (x, y) from the origin is given by $\sqrt{x^2 + y^2}$.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because the distance from origin for $(-5, 12)$ is 13 units. R is also true as it gives the correct distance formula. R correctly explains A, so (a) is correct.

Q7: Assertion (A): If a point lies in the fourth quadrant, its reflection in the x -axis lies in the first quadrant.

Reason (R): Reflection of a point (x, y) in the x -axis gives the point $(x, -y)$.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because reflecting a Quadrant IV point $(p, -q)$ across the x -axis gives (p, q) , which lies in Quadrant I. R is also true as it states the correct reflection rule. R correctly explains A, so (a) is correct.

Q8: Assertion (A): Every point on the x -axis is of the form $(a, 0)$, where a is any real number.

Reason (R): The x -axis is the set of all points equidistant from the y -axis.

Answer: (c) A is true but R is false.

Explanation: A is true because all points on the x-axis have $y = 0$, i.e., $(a, 0)$. R is false since equidistant from the y-axis does not define the x-axis. Hence, (c) is correct.

Q9: Assertion (A): The ordered pair $(3, 5)$ and $(5, 3)$ represent the same point in the coordinate plane.

Reason (R): In an ordered pair (x, y) , the order of coordinates does not matter.

Answer: (d) A is false but R is true.

Explanation: A is false because $(3, 5)$ and $(5, 3)$ are different points. R is also false since ordered pairs depend on correct order (x, y) , and swapping changes the point. Hence, (d) is correct.

Q10: Assertion (A): The points $A(1, 1)$, $B(4, 5)$ and $C(7, 9)$ are collinear.

Reason (R): Three points are collinear if the sum of distances between two pairs of adjacent points equals the distance between the outermost points, i.e., $AB + BC = AC$.

Answer: (a) Both A and R are true, and R is the correct explanation of A.

Explanation: A is true because $AB = 5$, $BC = 5$, and $AC = 10$, so $AB + BC = AC$, showing the points are collinear. R is also true as it gives the correct collinearity condition using distances. R correctly explains A, so (a) is correct.

