

Important Assertion And Reason Questions on Coordinate Geometry

Directions: In the following questions a statement of assertion (A) is followed by a statement of reason(R). Mark the correct choice as:

Choose the correct option for the following questions:

- (A). Both Assertion (A) and Reason (R) are true, and Reason is the correct explanation of Assertion.
- (B). Both Assertion (A) and Reason (R) are true, but Reason is not the correct explanation of Assertion.
- (C). Assertion (A) is true, but Reason (R) is false.
- (D). Assertion (A) is false, but Reason (R) is true.

Question 1:

Assertion (A): The distance between two points on a coordinate plane can be found using the distance formula.

Reason (R): The distance formula is derived using the Pythagoras Theorem.

Options:

- (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.

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

Question 2:

Assertion (A): The distance between the points $((2,3))$ and $((2,8))$ is 5 units.

Reason (R): Both points have the same x-coordinate.

Options:

- (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.

Correct Answer: (A). Both A and R are true, and R is the correct explanation of A. $|8-3|=5$

Question 3:

Assertion (A): The midpoint of the line segment joining (2,4) and (6,8) is (4,6).

Reason (R): The midpoint is obtained by averaging the x-coordinates and y-coordinates.

Options:

- (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.

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

Question 4:

Assertion (A): The point dividing a line segment in the ratio (1:1) is the midpoint.

Reason (R): The coordinates of the midpoint are the average of the coordinates of the endpoints.

Options:

- (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.

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

Question 5:

Assertion (A): The distance between (0,0) and (3,4) is 5 units.

Reason (R): The points satisfy the Pythagorean triplet relation.

$$3^2+4^2=5^2$$

Options:

- (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.

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

Question 6:

Assertion (A): The section formula is used to find the coordinates of a point dividing a line segment in a given ratio.

Reason (R): The point may divide the segment internally or externally.

Options:

- (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.

Correct Answer: (B). Both A and R are true, but R is not the correct explanation of A.

Question 7:

Assertion (A): The midpoint of a diameter of a circle is the center of the circle.

Reason (R): A diameter passes through the center of the circle.

Options:

- (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.

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

Question 8:

Assertion (A): The coordinates of the origin are (0,0).

Reason (R): The origin is the intersection point of the x-axis and y-axis.

Options:

- (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.

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

Question 9:

Assertion (A): The distance between two identical points is zero.

Reason (R): The coordinates of both points are equal.

Options:

- (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.

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

Question 10:

Assertion (A): The distance formula between (x_1, y_1) and (x_2, y_2) is:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Reason (R): The horizontal and vertical distances form the legs of a right triangle.

Options:

- (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.

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

Question 11:

Assertion (A): The midpoint formula can be applied only in the first quadrant.

Reason (R): Coordinates can be positive or negative in any quadrant.

Options:

- (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.

Correct Answer: (D). A is false, but R is true.

Question 12:

Assertion (A): The point (3,5) lies in the first quadrant.

Reason (R): Both coordinates are positive.

Options:

- (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.

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

Question 13:

Assertion (A): The midpoint of the points(-2,4)and(2,-4)is the origin.

Reason (R): The average of the x-coordinates and y-coordinates is zero.

Options:

- (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.

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

Question 14:

Assertion (A): The section formula depends on the ratio in which the point divides the line segment.

Reason (R): Different ratios produce different coordinates.

Options:

- (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.

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

Question 15:

Assertion (A): The coordinates of the midpoint of (x_1, y_1) and (x_2, y_2) are:

$(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$

Reason (R): The midpoint lies exactly halfway between the two points.

Options:

- (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.

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

