

Assertion and Reason Questions on Class 9 Maths Chapter 5: I'm Up and Down, and Round and Round

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.

Question 1

Assertion: A circle can be drawn through any three points on a plane.

Reason: Three non-collinear points determine a unique circle.

Answer: D

Explanation: The assertion is false because three points on one straight line do not form a circle. The reason is true, but only for non-collinear points.

Question 2

Assertion: The centre of the circumcircle of an acute-angled triangle lies inside the triangle.

Reason: The perpendicular bisectors of the sides of an acute triangle meet at a point inside it.

Answer: A

Explanation: Both statements are true, and the reason correctly explains why the circumcentre is inside an acute triangle.

Question 3

Assertion: A chord passing through the centre of a circle is the longest chord of that circle.

Reason: A chord through the centre is called the diameter.

Answer: A

Explanation: A diameter is the longest chord, so both statements are true and connected.

Question 4

Assertion: Equal chords of a circle subtend equal angles at the centre.

Reason: Equal chords are always equally distant from the centre.

Answer: A

Explanation: The chapter proves that equal chords subtend equal central angles, and they also lie at equal distances from the centre.

Question 5

Assertion: The line joining the centre of a circle to the midpoint of a chord is perpendicular to the chord.

Reason: A line from the centre to the midpoint of a chord splits the chord into two equal parts.

Answer: B

Explanation: Both statements are true, but the reason is not the full explanation of the assertion. The key fact is that the two triangles formed are congruent, which gives the right angle.

Question 6

Assertion: Chords that are at equal distance from the centre of a circle are equal in length.

Reason: The perpendicular from the centre to a chord bisects it.

Answer: B

Explanation: Both are true, but the reason alone does not explain why equal distances from the centre make the chords equal.

Question 7

Assertion: A longer chord lies closer to the centre of the circle.

Reason: The distance of a chord from the centre increases as the chord becomes longer.

Answer: C

Explanation: The assertion is true, but the reason is the opposite of the truth. In reality, longer chords lie closer to the centre.

Question 8

Assertion: The angle subtended by a diameter at any point on the circle is a right angle.

Reason: The angle subtended by an arc at the centre is twice the angle subtended at any point on the remaining part of the circle.

Answer: A

Explanation: A diameter subtends 180 degrees at the centre, so the angle on the circle is half of that, i.e. 90 degrees.

Question 9

Assertion: If a line segment subtends equal angles at two points on the same side of it, then those four points are concyclic.

Reason: Equal angles standing on the same chord imply the points lie on one circle.

Answer: A

Explanation: This is exactly the concyclicity idea from the chapter. The reason correctly explains the assertion.

Question 10

Assertion: In a cyclic quadrilateral, opposite angles add up to 180 degrees.

Reason: Each opposite angle is half of a full turn at the centre.

Answer: B

Explanation: The assertion is true because opposite angles of a cyclic quadrilateral are supplementary. However, the reason is not the correct explanation, since the proof is based on angles subtended by arcs, not on a full turn at the centre.

Question 11

Assertion: A circle has exactly one line of symmetry.

Reason: Every diameter of a circle is a line of reflection symmetry.

Answer: C

Explanation: The assertion is false because a circle has infinitely many lines of symmetry. The reason is true.

Question 12

Assertion: Infinitely many circles can pass through two given points.

Reason: The centres of all such circles lie on the perpendicular bisector of the segment joining the two points.

Answer: A

Explanation: Both statements are true. Since there are infinitely many points on the perpendicular bisector, there are infinitely many possible centres.

Question 13

Assertion: If two chords of a circle are equal, then they are equidistant from the centre.

Reason: Equal chords subtend equal angles at the centre.

Answer: A

Explanation: Equal chords give equal central angles, and this leads to equal distances from the centre.

Question 14

Assertion: The chord nearest to the centre is the longest chord of the circle.

Reason: The diameter is the greatest chord in a circle.

Answer: C

Explanation: The assertion is true because the chord closest to the centre is the diameter. The reason is also true, but it does not directly explain the assertion in a complete way.

Question 15

Assertion: If two opposite angles of a quadrilateral add up to 180 degrees, then the quadrilateral is cyclic.

Reason: A quadrilateral with supplementary opposite angles can be inscribed in a circle.

Answer: A

Explanation: Both are true, and the reason gives the correct converse of the cyclic quadrilateral theorem

