Important Assertion Reason Questions on Quadratic Equations

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): An equation of the form $ax2+bx+c=0$, where $a\neq0$, is called a quadratic equation.

Reason (R): The highest power of the variable in a quadratic equation is 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 2:

Assertion (A): The equation$x2-5x+6=0$has roots 2 and 3.

Reason (R): The equation can be factorised as:$x2-5x+6=(x-2)(x-3)$

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 3:

Assertion (A): A quadratic equation can have at most two real roots.

Reason (R): The degree of a quadratic equation is 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 4:

Assertion (A): The roots of the equation$x^2+4x+4=0$are equal.

Reason (R): The discriminant of the equation is zero, $D=b^2-4ac$

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 equation$x^2+1=0$has no real roots.

Reason (R): The discriminant of the equation is negative.

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 roots of the equation$2x^2-7x+3=0$are rational.

Reason (R): The discriminant of the equation is a perfect square.

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 7:

Assertion (A): Completing the square is a method used to solve quadratic equations.

Reason (R): In this method, the quadratic expression is converted into a perfect square trinomial.

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 quadratic formula can solve every quadratic equation.

Reason (R): The quadratic formula gives the roots directly in terms of coefficients.

x=−b±b2−4ac2a}

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 sum of the roots of ax2+bx+c=0is:−ba

Reason (R): The product of the roots is:ca

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 10:

Assertion (A): The equationx2−9=0has roots 3 and−3.

Reason (R): The equation can be factorised as:x2−9=(x−3)(x+3)

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): A quadratic equation may have imaginary roots.

Reason (R): If the discriminant is negative, the roots are not real.

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 12:

Assertion (A): The equationx2−4x+4=0has equal roots.

Reason (R): The equation is a perfect square.

x2−4x+4=(x−2)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 13:

Assertion (A): The roots of $x^2-2x-3=0$ are 3 and -1.

Reason (R): The equation can be factorised as:$x^2-2x-3=(x-3)(x+1)$

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 graph of a quadratic equation is a parabola.

Reason (R): A quadratic equation contains the square of the variable.

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 equation$x^2-16=0$has roots 4 and -4.

Reason (R): The equation represents the difference of two squares.

$x^2-16=(x-4)(x+4)$

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.