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CLASS X

ASSERTION AND REASON BASED QUESTIONS

MATHEMATICS

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Mathematics X

Chapter-wise
Assertion-Reason Questions,

ASSERTION – REASON QUESTIONS
[BASIC / STANDARD]

1. **Assertion (A) :** The H.C.F. of two numbers is 16 and their product is 3072. Then their L.C.M. = 162.

   Reason (R) : If a and b are two positive integers, then their H.C.F. × L.C.M. = $a \times b$.

   (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

2. **Assertion (A) :** 2 is a rational number.

   Reason (R) : The square root of all positive integers are irrationals

   (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

3. **Assertion (A) :** If LCM (p, q) = 30 and HCF (p, q) = 5, then $p \times q = 150$.

   Reason (R) : LCM of (a, b) × HCF of (a, b) = $a \times b$

   (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

4. **Assertion (A) :** $\sqrt{5}$ is an irrational number.

   Reason (R) : If m is an odd number greater than 1, then $\sqrt{m}$ is irrational.

   (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

5. **Assertion (A) :** Given that HCF (306, 657) = 9, and LCM (306, 657) is 2238.

   Reason (R) : If a and b are two positive integers and HCF (a, b) = 9, then LCM $(a + b) = \dfrac{a+b}{2}$

   (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

6. **Assertion (A) :** π is an irrational number.

   Reason (R) : $\sqrt{5}$ is an irrational number.

   (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

7. Assertion (A) : $\sqrt{3}+\sqrt{5}$ is an irrational number.

Reason (R) : The sum of a rational number and an irrational number is an irrational number.

(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

8. Assertion (A) : 6^n can end with the digit 0 for any natural number n.

Reason (R) : Any positive integer ending with the digits 0 or 5 is divisible by 5 and so its prime factorisation must contain the prime 5.

(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

9. Assertion (A) : The HCF of two numbers is 5 and their LCM is 150. If one of the numbers is 15, then the other is 50.

Reason (R) : For any two positive integers a and b HCF $(a, b) \times$ LCM $(a, b) = a \times b$

(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

10. Assertion (A) : 100 can be expressed as a product of primes.

Reason (R) : 100 is a composite number.

(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

11. Assertion (A) : $\sqrt{p}$ is an irrational number, where p is a prime number.

Reason (R) : Square root of any prime number is an irrational number.

(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

12. Assertion (A) : $x^2 + 4x + 5$ has two zeroes.

Reason (R) : A quadratic polynomial can have at the most two zeroes.

(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

13. Assertion (A) : Zeroes of $p(x) = x^2 - 4x - 5$ are 5, –1.

Reason (R) : The polynomial whose zeroes are $2 + \sqrt{3}$, $2 - \sqrt{3}$ is $x^2 - 4x + 7$.

(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

14. Assertion (A) : Degree of the zero polynomial is not defined.

Reason (R) : Degree of non-zero constant polynomial is 0.

(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

15. Assertion (A) : If 2, 3 are the zeroes of a quadratic polynomial, then the polynomial $x^2 - 5x + 6$.

Reason (R) : If α, β are the zeroes of a quadratic polynomial, then polynomial is $x^2 - (\alpha + \beta)\, x + \alpha \cdot \beta$

(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

16. Assertion (A) : The polynomial $x^4 + 4x^2 + 5$ has four zeroes.

Reason (R) : If $p(x)$ is divided by $(x - k)$, then the remainder = $p(k)$.

(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

17. Assertion (A) : If one zero of the polynomial $p(x) = (k^2 + 4)\, x^2 + 13x + 4k$ is reciprocal of other, then $k = 2$.

Reason (R) : If $(x - a)$ is a factor of $p(x)$, then $p(a) = 0$ i.e., a is a zero of $p(x)$.

(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

18. Assertion (A) : If α, β and γ are the zeroes of $x^3 - 2x^2 + qx - r$ and $\alpha + \beta = 0$, then $2q = r$.

Reason (R) : If α, β and γ are the zeroes of $ax^3 + bx^2 + cx + d$, then $\alpha + \beta + \gamma = \frac{-b}{a}$, $\alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a}$, $\alpha\beta\gamma = \frac{-d}{a}$.

(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

19. Assertion (A) : If α, β are the zeroes of the polynomial $x^2 - ax + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} = a$

Reason (R) : If α, β are the zeroes of the polynomial $ax^2 + bx + c$, then $\alpha + \beta = \frac{-b}{a}$, $\alpha\beta = \frac{c}{a}$.

(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

20. Assertion (A) : If α, β are the zeroes of the polynomial $x^2 - 3x + p$ and $2\alpha + 3\beta = 15$, then $p = 54$.

Reason (R) : If α, β are the zeroes of the polynomial $ax^2 + bx + c$, then $\alpha + \beta = \frac{-b}{a}$ and $\alpha\beta = \frac{c}{a}$.

(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

21. Assertion (A) : The graph of a polynomial $p(x)$ is as given in the figure, then number of zeroes of $p(x)$ is 2.

Reason (R) : If α, β are the zeroes of the polynomial $ax^2 + bx + c$, then $\alpha + \beta = \frac{-b}{a}$ and $\alpha\beta = \frac{c}{a}$.

(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

22. Assertion (A) : The polynomial of $p(x) = x^3 + x$ has only one real zero.

Reason (R) : A polynomial of nth degree must have n real zeroes.

(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

23. Assertion (A) : $2 - \sqrt{3}$ is one zero of the quadratic polynomial then other zero will be $2 + \sqrt{3}$.

Reason (R) : Irrational zeroes always occur in pairs.

(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

24. Assertion (A) : $p(x) = x^3 - 5x^2 + 6x + 5$ is a polynomial of degree 2.

Reason (R) : The highest power of x in the polynomial $p(x)$ is the degree of the polynomial.

(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

25. Assertion (A) : $3x + 4y + 5 = 0$ and $6x + ky + 9 = 0$ represent parallel lines if $k = 8$.

Reason (R) : $a_1x + b_1y + c_1 = 0$; $a_2x + b_2y + c_2 = 0$ represent parallel lines if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(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

26. Assertion (A) : $x + y - 4 = 0$ and $2x + ky - 3 = 0$ has no solution, if $k = 2$.

Reason (R) : $a_1x + b_1y + c_1 = 0$; $a_2x + b_2y + c_2 = 0$ are consistent if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(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

27. Assertion (A) : If the system of equations $2x + 3y = 7$ and $2ax + (a + b)y = 28$ has infinitely many solutions, then $2a - b = 0$

Reason (R) : The system of equations $3x - 5y = 9$ and $6x - 10y = 8$ has unique solution.

(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

28. Assertion (A) : If a pair of lines are coincident, then we say that pair is consistent and it has a unique solution.

Reason (R) : If a pair of lines are parallel, then the pair has no solution and is called inconsistent pair of equations.

(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

29. Assertion (A) : If $kx - y - 2 = 0$ and $6x - 2y - 3 = 0$ are inconsistent, then $k = 3$.

Reason (R) : $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are inconsistent if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(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

30. Assertion (A) : $3x - 4y = 7$ and $6x - 8y = k$ have infinite number of solution if $k = 14$

Reason (R) : $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have a unique solution if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(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

31. Assertion (A) : The linear equations $x - 2y - 3 = 0$ and $3x + 4y - 20 = 0$ have exactly one solution.

Reason (R) : The linear equations $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ have unique solution.

(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

32. Assertion (A) : $kx + 2y = 5$ and $3x + y = 1$ have unique solution if $k = 6$.

Reason (R) : $x + 2y = 3$ and $5x + ky + 7 = 0$ have unique solution, if $k \neq 10$.

(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

33. Assertion (A) : If the pair of equations $x + y = \sqrt{2}$ and $x\sin\theta + y\cos\theta = 1$ has infinitely many solutions, then $\theta = 45°$.

Reason (R) : The system of equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ has infinitely many solutions, if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$.

(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

34. Assertion (A) : If the pair of lines are coincident then we say that it has infinitely many solutions.

Reason (R) : If the pair of lines are parallel, then the pair has no solution and is called inconsistent pair of equations.

(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

35. Assertion (A) : $3x + 4y + 5 = 0$ and $6x + ky + 9 = 0$ represent parallel lines if $k = 8$.

Reason (R) : $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ represent parallel lines if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$.

(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

36. Assertion (A) : The pair of equations $ax + 2y = 7$ and $3x + by = 16$ represents parallel lines if $ab = 6$

Reason (R) : $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ represent parallel lines if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$.

(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

37. Assertion (A) : If the equation $x^2 - ax + b = 0$ and $x^2 + bx - a = 0$ have a common root then, $a + b \neq 0$ and $a - b = 1$.

Reason (R) : A common root of two equations satisfies both the equations.

(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

38. Assertion (A) : If the roots of the equation $\frac{1}{x+p} + \frac{1}{x+q} = \frac{1}{r}$ are equal in magnitude and opposite in sign, then p, r, q are in A.P.

Reason (R) : The sum of the roots of the equation $ax^2 + bx + c = 0$ is $\frac{b}{a}$.

(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

39. Assertion (A) : If roots of the equation $(2k - 1)x^2 + 4x - 3 = 0$ are reciprocal of each other, then $k = -1$.

Reason (R) : If $a = c$, then roots of $ax^2 + bx + c = 0$ are reciprocal of each other.

(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

40. Assertion (A) : The roots of the equation $x^2 + 3x + 4 = 0$ are imaginary.

Reason (R) : If for the quadratic equation $ax^2 + bx + c = 0$, $b \neq 0$, $b^2 - 4ac < 0$, then its roots are imaginary.

(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

41. Assertion (A) : Roots of every quadratic equation can be obtained by quadratic formula.

Reason (R) : If $ax^2 + bx + c = 0$, $b \neq 0$, then the quadratic formula for finding roots is $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(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

42. Assertion (A) : Roots of equation $x - \dfrac{1}{x} - 3$, $x \neq 0$ are $\dfrac{3 \pm \sqrt{13}}{2}$.

Reason (R) : Quadratic Equation $ax^2 + bx + c = 0$ has no real roots, if $D < 0$.

(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

43. Assertion (A) : If -5 is a root of $2x^2 + 2px - 15 = 0$ and $p(x^2 + x) + k = 0$ has equal roots then $k = \dfrac{7}{8}$.

Reason (R) : The equation $ax^2 + bx + c = 0$, $(a \neq 0)$ has equal roots, if $b^2 - 4ac = 0$

(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

44. Assertion (A) : The roots of $2x^2 + x - 6 = 0$ are -2 and $\dfrac{3}{2}$.

Reason (R) : Roots of the equation $ax^2 + bx + c = 0$, $a \neq 0$ are $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(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

45. Assertion (A) : If $px^2 - 2x + 2 = 0$ has no real roots, then $p > \dfrac{1}{2}$.

Reason (R) : The equation $(a^2 + b^2)\, x^2 + 2(ac + bd)\, x + (c^2 + d^2) = 0$ has no real roots, if $ad \neq bc$.

(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

46. Assertion (A) : The possible values of p for which $2x^2 + px + 3 = 0$ has two real roots is given by $p > 2\sqrt{6}$.

Reason (R) : The quadratic equation $ax^2 + bx + c = 0$ has two real roots if $b^2 - 4ac < 0$.

(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

47. Assertion (A) : $x^2 + 5kx + 16 = 0$ has no real roots if $-\frac{8}{5} < k < \frac{8}{5}$

Reason (R) : The quadratic equation $ax^2 + bx + c = 0$ ($a \neq 0$) has two equal roots if $b^2 - 4ac = 0$

(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

48. Assertion (A) : If one root of the quadratic equation $6x^2 - x - k = 0$ is $\frac{2}{3}$, then the value of k is 2.

Reason (R) : The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has atmost two roots.

(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

49. Assertion (A) : $(2x - 1)^2 - 4x^2 + 5 = 0$ is not a quadratic equation.

Reason (R) : An equation of the form $ax^2 + bx + c = 0$, $a \neq 0$, where $a, b, c \in R$ is called a quadratic equation.

(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

50. Assertion (A) : Sum of natural numbers from 1 to 100 is 5050

Reason (R) : Sum of n natural numbers is $\frac{n(n+1)}{2}$

(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

51. Assertion (A) : Sum of first 15 terms of $2 + 5 + 8 \ldots$ is 345.

Reason (R) : Sum of fist n terms in an A.P. is given by the formula:

$S_n = \frac{n}{2}[2a + (n - 1)d]$

(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

52. Assertion (A) : The common difference of 5, 4, 3, 2,… A.P. is –1.

Reason (R) : The constant difference between any two terms of an AP is commonly known as common difference.

(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

53. Assertion (A) : The value of n, if $a = 10$, $d = 5$, $a_n = 95$ is 16.

Reason (R) : The formula of general term a_n is $a_n = a + (n - 1)d$.

(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

54. Assertion (A) : The 11th term of an AP is 7, 9, 11, 13, ... is 27.

Reason (R) : If S_n is the sum of first n terms of an AP, then its nth term a_n is given by $a_n = S_n + S_{n-1}$

(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

55. Assertion (A) : The 10th term of the A.P. 5, 8, 11, 14, ... is 35.

Reason (R) : If S_n is the sum of the first n terms of an A.P., then its nth term a_n is given by $a_n = S_n - S_{n-1}$.

(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

56. Assertion (A) : The sum of the series with the nth term, $a_n = (9 - 5n)$ is 465, when number of terms, $n = 15$.

Reason (R) : The sum of first n terms of an AP is given by

$S_n = \frac{n}{2}[2a + (n - 1)d]$

(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

57. Assertion (A) : 5, 10, 15 are three consecutive terms of an AP.
Reason (R) : If a, b, c are three consecutive terms of an AP, then $2b = a + c$

(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

58. Assertion (A) : Sum of n terms of the AP. 3,13, 23… is $5n^2 - 8n$.

Reason (R) : The sum of first n terms of an AP is given by $S_n = \frac{n}{2}[2a + (n - 1)d]$

(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

59. Assertion (A) : Common difference of an AP, whose nth term is given by $a_n = 4n - 70$ is 4.

Reason (R) : $d = a_n - a_{n-1}$

(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

60. Assertion (A) : The first term of an AP is 5, the last term is 45 and its sum is 400. Then the number of terms of the AP = 12.

Reason (R) : Sum of first n even natural numbers is $n(n + 1)$.

(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

61. Assertion (A) : Common difference of the AP having sum of first n terms as $an^2 + bn$ is $2a$.

Reason (R) : If sum of n terms of an AP is denoted by S_n, then its nth term is $S_n - S_{n-1}$

(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

62. Assertion (A) : 10th term from the end of the AP: 100, 95, 90, 85,…10 is 55.

Reason (R) : The nth term from the end of the AP having last term l and common difference d is $l - (n - 1)d$.

(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

63. Assertion(A) : In a ΔABC, a line DE || BC, intersects AB in D and AC in E, then $\frac{AB}{AD} = \frac{AC}{AE}$.

Reason (R) : If a line is drawn parallel to one side of a triangle intersecting the other two sides, then the other two sides are divided in the same ratio.

(a) Both (A) and (R) are true and (R) is the correct explanation of (A)

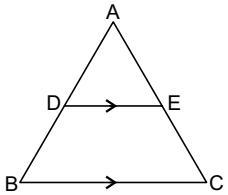
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(c) (A) is true but (R) is false

(d) (A) is false but (R) is true

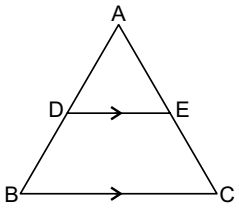
64. Assertion (A) : In the given figure, DE || BC and $\frac{AD}{DB} = \frac{3}{5}$. If AC = 4 .8 cm then the length of AE is 1.8 cm.

Reason (R) : If a line divides any two sides of a triangle in the same ratio, then the line must be parallel to the third side.



(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

65. Assertion (A) : In the given figure, DE || BC, so that AD = (4x – 3) cm, AE = (8x – 7) cm, BD = (3x – 1) cm and CE = (5x – 3) cm then, the value of x is 1.



Reason (R) : In triangle ABC, if DE || BC, then $\frac{AD}{BD} = \frac{AE}{CE}$

(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

66. Assertion (A) : The line segment joining the midpoints of any two sides of a triangle is parallel to the third side.

Reason (R) : A line drawn through the midpoint of one side of a triangle parallel to another side bisects the third side.

(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

67. Assertion (A) : A vertical stick which is 15 cm long casts a 12 cm long shadow on the ground. At the same time, a vertical tower casts a 50 m long shadow on the ground, then the height of the tower is 50 m.

Reason (R) : The ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides.

(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

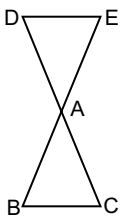
68. Assertion (A) : The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, then the corresponding side of the second triangle is 5.4 cm.

Reason (R) : The ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides.

(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

69. Assertion (A) : In the figure $\Delta ABC \sim \Delta AED$. If BC = 8 cm, AB = 6.5 cm, AD = 2.8 cm and DE = 4 cm, then AC = 5.6 cm.

Reason (R) : If in two triangles, angles of one triangle are proportional to the angles of the other triangle, then their correpsonding sides are equal, and hence, the two triangles are similar.



(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

70. Assertion (A) : All congruent triangles are similar but the similar triangles need not be congruent.

Reason (R) : If the corresponding sides of two triangles are proportional, then they are similar.

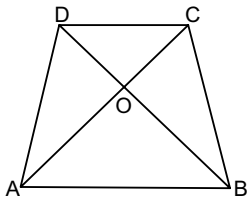
(a) Both (A) and (R) are true and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(c) (A) is true but (R) is false
(d) (A) is false but (R) is true

71. Assertion (A) : If the corresponding sides of two triangles are proportional then their corresponding angles are equal, and hence the two triangles are similar

Reason (R) : If the bisector of an angle of a triangle bisects the opposite side, then the triangle is isosceles.

(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

72. Assertion (A) : If in the given figure, AB is parallel to CD. If OA = $3x - 19$, OB = $x - 4$, OC = $x - 3$ and OD = 4, then $x = 11$ units or 8 units.



Reason (R) : The diagonals of a trapezium divide each other proportionally.

(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

73. Assertion (A) : In ΔABC, DE || BC and AD = $4x - 3$, AE = $8x - 7$, BD = $3x - 1$ and CE = $5x - 3$, then $x = 5$ units.

Reason (R) : If a line is drawn parallel to one side of a triangle to intersect the other two sides is distinct points, the other two sides are divided in the same ratio.

(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

74. Assertion (A) : A line drawn through the midpoint of one side of a triangle parallel to another side bisects the third side.

Reason (R) : In a ΔABC, if D is the mid-point of side AB and DE || BC, then AB = BC.

(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

75. Assertion (A) : In ΔABC, if D and E are midpoints of sides AB and AC, then DE || BC.
Reason (R) : If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional, then the two triangles are similar.

(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

76. Assertion (A) : Points (1, 7), (4, 2), (–1, –1) and (–4, 4) are the vertices of a square.
Reason (R) : If all the four sides of the quadrilateral are equal and diagonals are also equal, then quadrilateral is a square.

(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

77. Assertion (A) : The distance between the points (0, 0) and (36, 15) is 439.
Reason (R) : Distance from the origin of the point (x, y) is $\sqrt{x^2 + y^2}$.

(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

78. Assertion (A) : The point on the x-axis which is equidistant from (2, –5) and (–2, 9) is (8, 0).
Reason (R) : Points lies on the y-axis are always of the form (0, y).

(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

79. Assertion (A) : Points (1, 5), (2, 3) and (–2, –11) are collinear.
Reason (R) : Three points are said to be collinear, when they all lie of the same line.

(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

80. Assertion (A) : If P(x, y) is equidistant from the points A(7, 1) and B(3, 5), then $x - y = 2$.
Reason (R) : If point P is equidistant from the points A and B, then AP = BP.

(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

81. Assertion (A) : The coordinates of the midpoint P of the join of the points A(x_1, y_1) and B(x_2, y_2) is $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$.

Reason (R) : The mid-point of a line segment divides the line segment in the ratio 1:1.

(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

82. Assertion (A) : The point (–4, 6) divides the line segment joining the points A(–6, 10) and B(–7, 4) in the ratio $2:9$.

Reason (R) : The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1, y_1) and B(x_2, y_2) internally in the ratio $m_1 : m_2$ are $\left(\frac{m_1x_2 + m_2x_1}{m_1 + m_2}, \frac{m_1y_2 + m_2y_1}{m_1 + m_2}\right)$.

(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

83. Assertion (A) : If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, then the value of p is 7.

Reason (R) : Diagonals of parallelogram, ABCD bisect each other and therefore, midpoint of AC = midpoint of BD.

(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

84. Assertion (A) : If three vertices of a parallelogram taken in order are (–1, –6), (2, –5) and (7, 2), then its fourth vertex is (4,1).

Reason (R) : Diagonals of a parallelogram bisect each other.

(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

85. Assertion (A) : The points (5, –2), (6, 4) and (7, –2) are the vertices of an isosceles triangle.

Reason (R) : The points (1, 5), (2, 3) and (–2, –11) are collinear.

(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

86. Assertion (A) : If the points (8, 1), (k, –4), (2, –5) are collinear, then $k = 4$.

Reason (R) : Three points are said to be collinear if they all lie on the same line.

(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

87. Assertion (A) : Points A(3, 2), B(–2, –3) and C(2, 3) form a triangle.

Reason (R) : Sum of the two sides of a triangle is always greater than the third side.

(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

88. Assertion (A) : The coordinates of the point which divides the line segment joining the points (4, –3) and (8, 5) in the ratio $3:1$ are $\left(\frac{22}{3}, \frac{22}{3}\right)$.

Reason (R) : The ratio in which the y-axis divides the line segment joining the points (5, –6) and (–1, –4) is $5:1$.

(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

89. Assertion (A) : If $\sec\theta + \tan\theta = a$, then $\sec\theta = \frac{a^2+1}{2a}$

Reason (R) : $\text{cosec}^2\theta - \cot^2\theta = 1$

(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

90. Assertion (A) : If $x = 2\sin^2\theta$ and $y = 2\cos^2\theta + 1$, then the value of $x + y = 3$.

Reason (R) : For any value of θ, $\sin^2\theta + \cos^2\theta = 1$.

(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

91. Assertion (A) : The value of $\sin 60° \cos 30° + \sin 30° \cos 60°$ is 1

Reason (R) : $\sin 90° = 1$ and $\cos 90° = 0$

(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

92. Assertion (A) : The value of $2\tan^2 45° + \cos^2 30° - \sin^2 60°$ is 2.

Reason (R) : Value of $\tan 45° = 1$, $\cos 30° = \sqrt{\frac{3}{2}}$ and $\sin 60° = \sqrt{\frac{3}{2}}$.

(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

93. Assertion (A) : $\sin A$ is the product of sin and A.

Reason (R) : The value of $\sin\theta$ increases as θ increases.

(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

94. Assertion (A) : In a right ΔABC, right angled at B, if $\tan A = 1$, then $2\sin A \cdot \cos A = 1$

Reason (R) : $\sin A = \frac{1}{\sqrt{2}}$; $\cos A = \frac{1}{\sqrt{2}}$

(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

95. Assertion (A) : If $\cos A + \cos^2 A = 1$, then $\sin^2 A + \sin^4 A = 1$.

Reason (R) : $\sin^2 A + \cos^2 A = 1$, for any value of A.

(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

96. Assertion (A) : $\sin(A - B) = \sin A - \sin B$

Reason (R) : For any value of θ, $1 + \tan^2\theta = \sec^2\theta$

(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

97. Assertion (A) : In ΔABC, right-angled at B, AB = 24 cm, BC = 7 cm. The value of $\tan C$ is $\frac{24}{7}$.

Reason (R) : $\tan C = \frac{AB}{BC}$.

(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

98. Assertion (A) : $\frac{2\tan 30°}{1+\tan^2 30°} = \sin 60°$

Reason (R) : $\tan 30° = \frac{1}{\sqrt{3}}$

(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

99. Assertion (A) : $\cot A$ is not defined for $A = 0°$

Reason (R) : $\sin\theta = \cos\theta$ for all values of θ.

(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

100. Assertion (A) : If θ is an acute angle and $\sin\theta = \cos\theta$, then the value of $2\tan^2\theta + \sin^2\theta = 1$

Reason (R) : If $\cos(40° + x) = \sin 30°$, then the value of x is 20°.

(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

101. Assertion (A) : $\sin(A + B) = 1$, $\cos(A - B) = 1$, then $A = 45°$ and $B = 45°$.

Reason (R) : If $\sin(A + B) = 1$, then $A + B = 90°$ and if $\cos(A - B) = 1$, then $A - B = 0°$.

(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

102. Assertion (A) : If the angle of elevation of Sun, above a perpendicular line (tower) decreases, then the shadow of tower increases.

Reason (R) : It is due to decrease in slope of the line of sight.

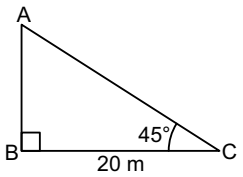
(a) Both (A) and (R) are true and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(c) (A) is true but (R) is false
(d) (A) is false but (R) is true

103. Assertion (A) : When we move towards the object, angle of elevation decreases.

Reason (R) : As we move towards the object, it subtends large angle at our eye than before.

(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

104. Assertion (A) : In the figure, if BC = 20 m, then the hypotenuse $AC = \frac{40}{\sqrt{2}}$ m.



Reason (R) : For any acute angle θ, $\cos\theta = \frac{\text{base}}{\text{hypotenuse}}$

(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

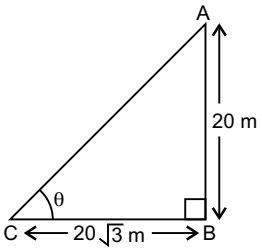
105. Assertion (A) : If the length of shadow of a vertical pole is equal to its height, then the angle of elevation is 45°.

Reason (R) : According to Pythagoras Theorem, $H^2 = P^2 + B^2$, where P = Perpendicular, B = Base and H = Hypotenuse.

(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

106. Assertion (A) : The angle of elevation of an object viewed, is the angle formed by the line of sight with the horizontal when it is above the horizontal level.
Reason (R) : The angle of depression of an object viewed, is the angle formed by the line of sight with the horizontal when it is below the horizontal level.
(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

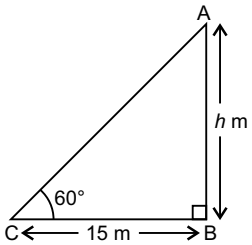
107. Assertion (A) : The angle of elevation of the Sun is 30°, when the shadow of a pole h metres high is $\sqrt{3}\,h$ metres long.



Reason (R) : In ΔABC, $\tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30°$
(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

108. Assertion (A) : At some time of the day, the length of the shadow of a tower is equal to its height, then the sun's altitude is 45°.
Reason (R) : The angle which the line of sight makes with the horizontal line passing through the eye of the observer, when the object is above the observer is called the angle of elevation.
(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

109. Assertion (A) : A tower stands vertically on the ground. From a point on the ground, which is 15 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60°. Then the height of the tower is $15\sqrt{3}$ m.



Reason (R) : In ΔABC, $\tan 60° = \frac{AB}{BC} \Rightarrow \sqrt{3} = \frac{h}{15} \Rightarrow h = 15\sqrt{3}$ m
(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

110. Assertion (A) : A line which intersects a circle in two distinct points is called a secant to the circle.

Reason (R) : A line meeting a circle only in one point is called a tangent to the circle at that point.

(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

111. Assertion (A) : From a point P, 10 cm away from the centre of a circle, a tangent PT of length 8 cm is drawn, then the radius of the circle is 5 cm.

Reason (R) : A line drawn through the end of a radius and perpendicular to it is a tangent to the circle.

(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

112. Assertion (A) : The tangents drawn at the ends of a diameter of a circle are parallel.

Reason (R) : The line segment joining the points of contact of two parallel tangents to a circle is a diameter of the circle.

(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

113. Assertion (A) : The angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the points of contact to the centre.

Reason (R) : The tangent to a circle is perpendicular to the radius through the point of contact.

(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

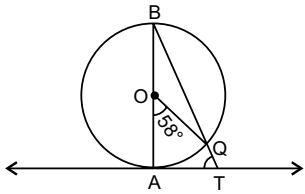
114. Assertion(A) : There is one and only one tangent at any point on the circumference of a circle.

Reason (R) : The perpendicular at the point of contact of the tangent to a circle never passes through the centre.

(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

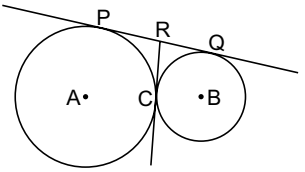
115. Assertion (A) : In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58°$, then $\angle ABQ = 29°$.

Reason (R) : The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.



(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

116. Assertion (A) : In the given figure, two circles touch each other at the point C. The common tangent to the circles at C, bisects the common tangent at P and Q.



Reason (R) : Tangents drawn from an external point to a circle are equal.

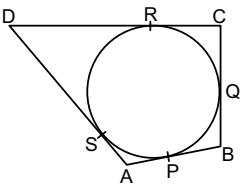
(a) Both (A) and (R) are true and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(c) (A) is true but (R) is false
(d) (A) is false but (R) is true

117. Assertion (A) : A circle is inscribed in a ΔABC, touching BC, CA and AB at P, Q and R respectively. If AB = 10 cm, AQ = 7 cm and CQ = 5 cm then the length of BC is 8 cm.

Reason (R) : We know that the lengths of tangents drawn from an external point to a circle are equal.

(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

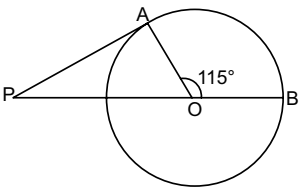
118. Assertion (A) : If a quadrilateral ABCD is drawn to circumscribe a circle, as shown in the figure, then AB + CD = AD + BC.



Reason (R) : The parallelogram circumscribing a circle is a rhombus

(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

119. Assertion (A) : In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle AOB = 115°$, then $\angle APO = 25°$.



Reason (R) : The tangent at a point to a circle is perpendicular to the radius passing through the point of contact.

(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

120. Assertion (A) : If the length of a tangent from an external point to a circle is 8 cm, then the length of the other tangent from the same point the circle is 8 cm.

Reason (R) : Length of the tangents drawn from an external point to a circle are equal.

(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

121. Assertion (A) : In two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

Reason (R) : The lengths of tangents drawn from an external point to a circle are equal.

(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

122. Assertion (A) : The tangents drawn at the ends of a diameter of a circle are parallel

Reason (R) : Opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

(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

123. Assertion (A) : In a circle of radius 6 cm, the angle of a sector is 60°. Then the area of the sector is $\frac{132}{7}$ cm^2.

Reason (R) : Area of the circle with radius r is πr^2.

(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

124. Assertion (A) : If the circumference of a circle is 176 cm, then its radius is 28 cm.

Reason (R) : Circumference = $2\pi \times$ radius.

(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

125. Assertion (A) : The length of the minute hand of a clock is 7 cm. Then the area swept by the minute hand in 5 minutes is $\frac{77}{6}$ cm^2.

Reason (R) : The length of an arc of a sector of angle θ and radius r is given by $l = 2\pi r \times \frac{\theta}{360°}$

(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

126. Assertion (A) : In a circle of radius 6 cm, the angle of a sector 60°. Then the area of the sector is $18\frac{6}{7}$ cm^2

Reason (R) : Circumference of the circle with radius r is $2\pi r$.

(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

127. Assertion (A) : If the circumference of a circle is 176 cm ,then its radius is 28 cm.

Reason (R) : Circumference = $2\pi r$

(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

128. Assertion (A) : A wire is looped in the form of a circle of radius 28 cm. It is bent into a square. Then the area of the square is 1936 cm^2.

Reason (R) : Angle described by a minute hand in 1 minute = 6°.

(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

129. Assertion (A) : A bicycle wheel makes 5000 revolutions in covering 11 km. Then diameter of the wheel is 35 cm.

Reason (R) : If a wire of length 22 cm is bent in the shape of a circle, then area of the circle so formed is 38.5 cm^2.

(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

130. Assertion (A) : If the circumference of two circles are in the ratio 2 : 3, then ratio of their areas is 4 : 9.

Reason (R) : The circumference of a circle of radius r is $2\pi r$ and its area is πr^2.

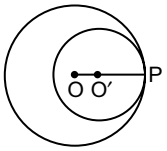
(a) Both (A) and (R) are true and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(c) (A) is true but (R) is false
(d) (A) is false but (R) is true

131. Assertion (A) : Distance moved by a wheel in 1 rotation = its area.

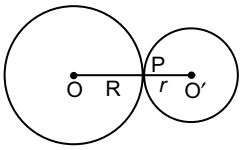
Reason (R) : Number of rotations in 1 minute = $\frac{\text{distance moved in 1 minute}}{\text{circumference}}$

(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

132. Assertion (A) : When two circles touch internally [see fig. (i)], then distance between their centres = difference of their radii



Reason (R) : When two circles touch externally [see fig. (ii)], then distance between their centres = sum of their radii



(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

133. Assertion (A) : Two circles touch externally. The sum of their areas is 130π sq cm and the distance between their centres is 14 cm. Then, radii of the circles are 11 cm and 3 cm.

Reason (R) : When two circles touch externally, then sum of their radii = distance between their centres.

(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

134. Assertion (A) : Two circles touch internally. The sum of their areas is 116π cm^2 and the distance between their centres is 6 cm. Then, radii of the circles are 4 cm and 10 cm.

Reason (R) : When two circles touch internally. Then, difference of their radii = distance between their centres

(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

135. Assertion (A) : A chord of a circle of radius 14 cm makes a right angle at the centre. The area of the minor segment is 56 cm^2.

Reason (R) : Angle described by the minute hand in 5 minutes = 6°

(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

136. Assertion (A) : Volume of a cylinder of radius 7cm and height 10 cm is 490π cm^3.

Reason (R) : Volume of a cylinder = $\pi r^2 h$

(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

137. Assertion (A) : Length of diagonal of a cube of side 7 cm is $7\sqrt{3}$ cm.

Reason (R) : Length of diagonal of a cube of edge x unit = $\frac{x}{\sqrt{3}}$ units.

(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

138. Assertion (A) : Volume of a hemisphere of radius $\frac{7}{2}$ cm is $\frac{343}{4}\pi$ cm^3.

Reason (R) : Volume of a hemisphere of radius r is given by $\frac{2}{3}\pi r^3$.

(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

139. Assertion (A) : Slant height of a cone of height 4 cm and radius 3 cm is 5 cm.

Reason (R) : Curved surface area of a cone is given by πrl.

(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

140. Assertion (A) : Volume of a cube having length of diagonal as $5\sqrt{3}$ cm is 125 cm^3.

Reason (R) : For a cube, Diagonal = side $\sqrt{3}$ and volume = (side)^3

(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

141. Assertion (A) : Surface area of a cuboid of length = 5 m, breadth = 3 m and height = 2 m is 30 m^3.

Reason (R) : Surface area of a cuboid = 2 (L × B + B × H + H × L)

(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

142. Assertion (A) : Volume of a cylinder of radius 2 cm and height 3 cm is 12π cm^3.

Reason (R) : Total surface area of a cylinder = $2\pi r(r + h)$.

(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

143. Assertion (A) : Volume of a cone of height 7 cm and radius 10 cm is $\frac{700}{3}\pi$ cm^3.

Reason (R) : Volume of cone = $\frac{1}{3}\pi r^2 h$

(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

144. Assertion (A) : Total surface area of a hemisphere of radius 2 cm is 4π cm^2.

Reason (R) : Total surface area of a hemisphere = $3\pi r^2$

(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

145. Assertion (A) : Surface area of a sphere of radius 10 cm is 400π cm^2.

Reason (R) : Surface area of a sphere of radius r in $\frac{4}{3}\pi r^3$.

(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

146. Assertion (A) : The maximum volume of a cone that can be carved out of a solid hemisphere of radius r is $\frac{1}{3} r^3$.

Reason (R) : For a cone of radius r and height h, volume is given by $\pi r^2 h$.

(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

147. Assertion (A) : The largest sphere is carved out of a cube of side 7 cm. Then, the volume of the sphere is $\frac{539}{3}$ cm^3.

Reason (R) : Volume of a sphere = $\frac{1}{3}\pi r^2$.

(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

148. Assertion (A) : The volume of the largest right circular cone that can be cut out of a cube whose edge is 7 cm is 50 cm^2.

Reason (R) : Volume of a cone is $\frac{1}{3}\pi r^2 h$.

(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

149. Assertion (A) : If the median and mode of a frequency distribution are 50 and 60 respectively, then its mean is 45.

Reason (R) : Mean, median and mode of a frequency distribution are related as:
Mode = 3(Median) – 2(Mean)

(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

150. Assertion (A) : Median of first eleven prime numbers is 13.

Reason (R) : Median of a grouped frequency distribution is given by

Median = $l + \frac{\frac{N}{2} - cf}{f} \times h$, l = lower limit of the median class, cf = cumulative frequency of the class preceding the median class, f = frequency of the median class, h = class width, N=Total frequency.

(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

151. Assertion (A) : The following table shows the weights of 12 students.

Weight(in kg)	67	70	72	73	75
Number of students	4	3	2	2	1

Mean of the given data is 70.25 kg

Reason (R) : If A is the assumed mean and $\bar{x}$ is the mean for a frequency distribution, then $\bar{x}$ = A + $\frac{1}{N} \Sigma f_i d_i$, where $d_i = x_i$ – A and N = $\sum_{i=1}^{n} f_i x_i$.

(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

152. Assertion (A) : The mode of the following distribution is 52.

Class interval	0-20	20-40	40-60	60-80
Frequency	4	3	2	2

Reason (R) : The value of the observation which occurs most often is the mode.

(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

153. Assertion (A) : Consider the following frequency distribution:

Class interval	3-6	6-9	9-12	12-15	15-18	18-21
Frequency	2	5	21	23	10	12

The mode of the above data is 12.4.

Reason (R) : The value of the observation which occurs most often is the mode.

(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

154. Assertion (A) : If the mean of the following distribution is 7.5, then the value of missing frequency f is 8.

x_i	5	6	7	8	9	10	11	12
f_i	20	17	16	10	f	6	7	6

Reason (R) : Mean, $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$

(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

155. Assertion (A) : The mean of the following data is 9.

x	4	6	9	10	15
f	5	10	10	7	8

Reason (R) : Mean, $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$

(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

156. Assertion (A) : The median of following distribution is 35.

x	20	25	35	40	50
f	5	11	24	16	5

Reason (R) : For odd number of observations (n), median = $\left(\frac{n+1}{2}\right)^{th}$ observation.

(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

157. Assertion (A) : The probability that a leap year has 53 Mondays is $\frac{2}{7}$.

Reason (R) : The probability that a non-leap year has 53 Mondays is $\frac{1}{7}$.

(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

158. Assertion (A) : When a die is rolled, the probability of getting a number which is a multiple of 3 and 5 both is zero.

Reason (R) : The probability of an impossible event is zero.

(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

159. Assertion (A) : A cubical die is rolled. The probability of getting a composite number is $\frac{1}{3}$.

Reason (R) : In a throw of a cubical die, the probability of getting a prime number is $\frac{2}{3}$.

(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

160. Assertion (A) : Manisha and Madhvi were born in the year 2000. The probability that they have the same birthday is $\frac{1}{366}$.

Reason (R) : Leap year has 366 days.

(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

161. Assertion (A) : If a box contains 5 white, 2 red and 4 black marbles, then the probability of not drawing a white marble from the box is $\frac{5}{11}$.

Reason (R) : $P(\overline{E}) = 1 - P(E)$, where E is any event.

(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

162. Assertion (A) : In rolling dice, the probability of getting the number 8 is zero.

Reason (R) : It is an impossible event.

(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

163. Assertion (A) : In tossing a coin one time, probability of getting head and tail are equal.

Reason (R) : Probability of a certain event is 1.

(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

164. Assertion (A) : Probability of getting at least one head in tossing 3 coins together is $\frac{1}{8}$.

Reason (R) : When three coins are tossed simultaneously, then sample space is HHH, HHT, HTH, HTT, THH, THT, TTH, TTT.

(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

165. Assertion (A) : Probability of a sure event is 1.

Reason (R) : For a sure event, number of favorable outcomes is less than the total number of outcomes.

(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

166. Assertion (A) : Probability of getting a doublet in a single throw of a pair dice is 1.

Reason (R) : Probability of a sure event is 1.

(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

167. Assertion (A) : Probability of getting an even number or an odd number in a single throw of a die is 1.

Reason (R) : Each elementary event is a favourable event.

(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

168. Assertion (A) : Probability of any even cannot be more than 1.

Reason (R) : $P(E) + P(\overline{E}) = 0$

(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

169. Assertion (A) : It is given that in a group of 3 students, the probability of 2 students not having the same birthday is 0.992. The probability that the 2 students have the same birthday is 0.008.

Reason (R) : $P(E)+P(\overline{E})=1$, where $\overline{E}$ denotes the event of non-occurrence of event E.

(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

ANSWERS

1. (d)	**2.** (c)	**3.** (a)	**4.** (c)	**5.** (c)	**6.** (b)	**7.** (b)	**8.** (a)	**9.** (a)	**10.** (a)
11. (a)	**12.** (b)	**13.** (c)	**14.** (b)	**15.** (a)	**16.** (b)	**17.** (d)	**18.** (a)	**19.** (b)	**20.** (a)
21. (b)	**22.** (c)	**23.** (a)	**24.** (d)	**25.** (a)	**26.** (b)	**27.** (c)	**28.** (d)	**29.** (a)	**30.** (a)

31. (c)	**32.** (d)	**33.** (c)	**34.** (b)	**35.** (a)	**36.** (c)	**37.** (a)	**38.** (c)	**39.** (a)	**40.** (a)
41. (a)	**42.** (b)	**43.** (a)	**44.** (a)	**45.** (d)	**46.** (c)	**47.** (a)	**48.** (b)	**49.** (a)	**50.** (c)
51. (d)	**52.** (a)	**53.** (d)	**54.** (c)	**55.** (d)	**56.** (d)	**57.** (a)	**58.** (d)	**59.** (a)	**60.** (d)
61. (a)	**62.** (a)	**63.** (a)	**64.** (b)	**65.** (a)	**66.** (b)	**67.** (d)	**68.** (a)	**69.** (c)	**70.** (b)
71. (b)	**72.** (a)	**73.** (a)	**74.** (b)	**75.** (b)	**76.** (a)	**77.** (a)	**78.** (d)	**79.** (d)	**80.** (a)
81. (a)	**82.** (d)	**83.** (a)	**84.** (a)	**85.** (c)	**86.** (d)	**87.** (a)	**88.** (b)	**89.** (b)	**90.** (a)
91. (b)	**92.** (a)	**93.** (d)	**94.** (a)	**95.** (a)	**96.** (d)	**97.** (a)	**98.** (a)	**99.** (c)	**100.** (b)
101. (a)	**102.** (a)	**103.** (d)	**104.** (a)	**105.** (b)	**106.** (b)	**107.** (a)	**108.** (a)	**109.** (a)	**110.** (b)
111. (d)	**112.** (b)	**113.** (a)	**114.** (c)	**115.** (a)	**116.** (a)	**117.** (a)	**118.** (b)	**119.** (a)	**120.** (a)
121. (b)	**122.** (b)	**123.** (b)	**124.** (a)	**125.** (a)	**126.** (b)	**127.** (a)	**128.** (b)	**129.** (d)	**130.** (a)
131. (d)	**132.** (b)	**133.** (a)	**134.** (a)	**135.** (c)	**136.** (a)	**137.** (c)	**138.** (d)	**139.** (b)	**140.** (a)
141. (d)	**142.** (b)	**143.** (a)	**144.** (d)	**145.** (c)	**146.** (c)	**147.** (c)	**148.** (d)	**149.** (a)	**150.** (b)
151. (a)	**152.** (d)	**153.** (a)	**154.** (a)	**155.** (a)	**156.** (a)	**157.** (b)	**158.** (a)	**159.** (c)	**160.** (b)
161. (d)	**162.** (a)	**163.** (b)	**164.** (d)	**165.** (c)	**166.** (b)	**167.** (a)	**168.** (a)	**169.** (a)	

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