

Topic :-LINEAR INEQUALITIES

- If $\log_3 x - \log_x 27 < 2$, then x belongs to the interval
a) $(1/3, 27)$ b) $(1/27, 3)$ c) $(1/9, 9)$ d) None of these
- The set of all solutions of the inequation $x^2 - 2x + 5 \leq 0$ in R is
a) $R - (-\infty, -5)$ b) $R - (5, \infty)$ c) \emptyset d) $R - (-\infty, -4)$
- $2^{\sin^2 x} + 2^{\cos^2 x}$ is
a) ≤ 2 b) ≥ 2 c) ≤ 1 d) ≥ 1
- If $a^2 + b^2 + c^2 = 1$, then $ab + bc + ca$ lies in the interval
a) $[-\frac{1}{2}, 1]$ b) $[0, \frac{1}{2}]$ c) $[0, 1]$ d) $[1, 2]$
- The equation $\sqrt{4x+9} - \sqrt{11x+1} = \sqrt{7x+4}$ has
a) No solution
b) One solution
c) Two solutions
d) More than two solutions
- $|x + \frac{2}{x}| < 3$, then x belongs to
a) $(-2, -1) \cup (1, 2)$ b) $(-\infty, -2) \cup (-1, 1) \cup (2, \infty)$
c) $(-2, 2)$ d) $(-3, 3)$
- If a, b, c are the sides of a triangle, then $\frac{a}{b+c-a} + \frac{b}{c+a-b} + \frac{c}{a+b-c}$ is
a) ≤ 3 b) ≥ 3 c) ≥ 2 d) ≤ 2
- The minimum value of the sum of the lengths of diagonals of a cyclic quadrilateral of area a^2 square units is
a) $\sqrt{2}a$ b) $2\sqrt{2}a$ c) $2a$ d) None of these
- $|2x - 3| < |x + 5|$, then x belongs to
a) $(-3, 5)$ b) $(5, 9)$ c) $(-\frac{2}{3}, 8)$ d) $(-8, \frac{2}{3})$

10. The number of real roots of the equation $1 + a_1x + a_2x^2 + \dots + a_nx^n = 0$, where $|x| < \frac{1}{3}$ and $|a_n| < 2$, is

- a) n if n is even b) 1 if n is odd c) 0 for any $n \in N$ d) None of these

11. Consider the following statements:

1. If x be real, then $-\frac{9}{2} \leq \frac{3x-4}{x^2+1} \leq \frac{1}{2}$

2. If x is real, then the greatest value of $\frac{x^2+14x+9}{x^2+2x+3}$ is 4

3. If $ax^2 + bx + c = 0$; $a \neq 0, a, b, c \in R$ has no real roots, then $(a + b + c)c > 0$

Which of these is/ are correct?

- a) Only (1) b) Only (2) c) Only (3) d) All of these

12. If r is a real number such that $|r| < 1$ and if $a = 5(1 - r)$, then

- a) $0 < a < 5$ b) $-5 < a < 5$ c) $0 < a < 10$ d) $0 \leq a < 10$

13. The number of integral roots of the equation $e^{x-8} + 2x - 17 = 0$, is

- a) 1 b) 2 c) 4 d) 8

14. The product of real roots of the equation $x^2 + 18x + 30 = 2\sqrt{x^2 + 18x + 45}$, is

- a) 720 b) 20 c) 36 d) None of these

15. The set of values of x satisfying $2 \leq |x - 3| < 4$ is

- a) $(-1, 1] \cup [5, 7)$ b) $-4 \leq x \leq 2$
c) $-1 < x < 7$ or $x \geq 5$ d) $x < 7$ or $x \geq 5$

16. Let $x = \left[\frac{a+2b}{a+b}\right]$ and $y = \frac{a}{b}$, where a and b are positive integers. If $y^2 > 2$, then

- a) $x^2 \leq 2$ b) $x^2 < 2$ c) $x^2 > 2$ d) $x^2 \geq 2$

17. The least value of $5^{\sin x - 1} + 5^{-\sin x - 1}$ is

- a) 10 b) $\frac{5}{2}$ c) $\frac{2}{5}$ d) $\frac{1}{5}$

18. If $x^2 + 2x + n > 10$ for all real numbers x , then which of the following conditions is true?

- a) $n < 11$ b) $n = 10$ c) $n = 11$ d) $n > 11$

19. The minimum value of $P = bcx + cay + abz$, when $xyz = abc$, is

- a) $3abc$ b) $6abc$ c) abc d) $4abc$

20. If $a_i > 0$ for $i = 1, 2, \dots, n$ and $a_1 a_2 \dots a_n = 1$, then minimum value of $(1 + a_1)(1 + a_2) \dots (1 + a_n)$ is

- a) $2^{n/2}$ b) 2^n c) 2^{2n} d) 1