

11. If $x^2 + 2ax + 10 - 3a > 0$ for all $x \in R$, then
 a) $-5 < a < 2$ b) $a < -5$ c) $a > 5$ d) $2 < a < 5$
12. The least integer satisfying $49.4 - \left(\frac{27-x}{10}\right) < 47.4 - \left(\frac{27-9x}{10}\right)$, is
 a) 2 b) 3 c) 4 d) None of these
13. For positive real number a, b, c which one of the following holds?
 a) $a^2 + b^2 + c^2 \geq bc + ca + ab$ b) $(b+c)(c+a)(a+b) \leq 8abc$
 c) $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} \leq 3$ d) $a^3 + b^3 + c^3 \leq 3abc$
14. The least perimeter of a cyclic quadrilateral of given area A square units is
 a) \sqrt{A} b) $2\sqrt{A}$ c) $3\sqrt{A}$ d) $4\sqrt{A}$
15. The number of solutions of $[\sin x + \cos x] = 3 + [-\sin x] + [-\cos x]$ in the interval $[0, 2\pi]$ is (where $[\cdot]$ denotes the greatest integer function)
 a) 0 b) 4 c) Infinite d) 1
16. The number of solutions of $3^{|x|} = |2 - |x||$ is
 a) 0 b) 2 c) 4 d) Infinite
17. If C is an obtuse angle in triangle, then
 a) $\tan A \tan B < 1$ b) $\tan A \tan B > 1$ c) $\tan A \tan B = 1$ d) None of these
18. If x, y, z are three real numbers such that $x + y + z = 4$ and $x^2 + y^2 + z^2 = 6$, then the exhaustive set of values of x , is
 a) $[2/3, 2]$ b) $[0, 2/3]$ c) $[0, 2]$ d) $[-1/3, 2/3]$
19. The number of roots of the equation $[\sin^{-1} x] = x - [x]$, is
 a) 0 b) 1 c) 2 d) None of these
20. If $3^{x/2} + 2^x > 25$, then
 a) $x \in [4, \infty)$ b) $(4, \infty)$ c) $x \in (-\infty, 4]$ d) $x \in [0, 4]$