

Set-C

- (1) The latus rectum of the hyperbola $16x^2 - 9y^2 = 144$ is _____
(a) $\frac{16}{3}$ (b) $\frac{32}{3}$ (c) $\frac{8}{3}$ (d) $\frac{4}{3}$
- (2) For any 2×2 matrix A, if $A(\text{Adj}A) = \begin{bmatrix} 10 & 0 \\ 0 & 10 \end{bmatrix}$, then $|A|$ is _____
(a) 0 (b) 10 (c) 20 (d) 100
- (3) If $(\vec{a} \times \vec{b})^2 + (\vec{a} \cdot \vec{b})^2 = 144$ and $|\vec{a}| = 4$, then $|\vec{b}| =$ _____
(a) 16 (b) 8 (c) 3 (d) 12
- (4) The perpendicular distance of the point (2, 4, -1) from the line $\frac{x+5}{1} = \frac{y+3}{4} = \frac{z-6}{-9}$ is _____
(a) 3 (b) 5 (c) 7 (d) 9
- (5) A polygon has 44 diagonals. The number of its sides are _____
(a) 10 (b) 11 (c) 12 (d) 13
- (6) $\lim_{x \rightarrow 0} \frac{\log(1+ax) + \log(1+bx)}{x}$ is equal to _____
(a) $a - b$ (b) $a + b$ (c) ab (d) $\frac{a}{b}$
- (7) If $(i+i)^{100} = 2^{49}(x+iy)$, then $x^2 + y^2 =$ _____
(a) 16 (b) 8 (c) 4 (d) 2
- (8) $\sec^2(\tan^{-1} 2) + \text{cosec}^2(\cot^{-1} 3) = \dots$
(a) 5 (b) 10 (c) 25 (d) 20
- (9) Let $f(x) = x^3 - 6x^2 + 9x + 8$, then $f(x)$ is strictly increasing in
(a) $(-\infty, 2)$ (b) $(1, 3)$ (c) $(3, \infty)$ (d) $(-\infty, 1) \cup (3, \infty)$
- (10) The number of terms in the expansion of $(x+y)^{100} + (x-y)^{100}$ after simplification is _____
(a) 50 (b) 51 (c) 202 (d) none of these.
- (11) Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The values of m and n are
(a) 7, 6 (b) 6, 3 (c) 5, 1 (d) 8, 7

(13) If the set A has p elements, B has q elements, then the number of elements in $A \times B$ is _____

- (a) $p+q$ (b) $p+q+1$ (c) pq (d) p^2

(14) The fourth vertex of the square formed by the points (2, 2), (4, 3), (-2, 5) is _____

- (a) (2, 3) (b) (-3, 3) (c) (-4, 3) (d) (4, 3)

(15) $\int \frac{xe^x}{(1+x)^2} dx$ is equal to

- (a) $\frac{-e^x}{1+x}$ (b) $\frac{(1+2x)e^x}{1+x}$ (c) $\frac{(-1+2x)e^x}{1+x}$ (d) $\frac{e^x}{1+x}$

(16) The probability that a leap year selected at random will contain 53 Sundays is _____

- (a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{6}{7}$ (d) $\frac{3}{7}$

(17) The value of $\int_0^{\pi/2} e^{\sin x} \cos x dx$ is _____

- (a) 0 (b) 1 (c) -1 (d) $e - 1$

(18) $\lim_{x \rightarrow \pi/4} \frac{1 + \tan x}{\cos 2x}$ is _____

- (a) 1 (b) 0 (c) -2 (d) -1

(19) If the mean of 1, 2, 3, ..., N is $\frac{6n}{11}$, then n is _____

- (a) 10 (b) 12 (c) 11 (d) 13

(20) The area bounded by the curve $y^2 = 2x$ and the lines $x = 1$, $x = 4$ and $y = 0$ in the first quadrant is _____

- (a) 7 (b) 14 (c) 28 (d) $\frac{14}{3}$