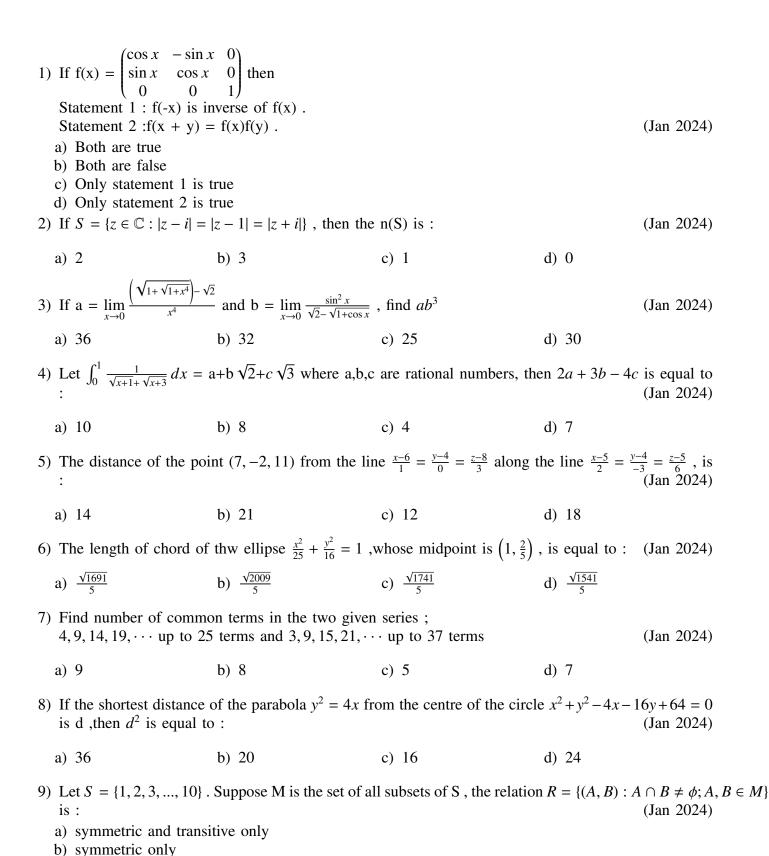
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Assignment 1

EE24Btech11036 - Krishna Hanumanth Patil



10) Let $x = x(t)$ and $y = y(t)$ be the solutions of the diffrential equations $\frac{dx}{dt} + ax = 0$ and $\frac{dy}{dt} + by = 0$ respectively, $a, b \in \mathbb{R}$. Given that $x(0) = 2$, $y(0) = 1$ and $3y(1) = 2x(1)$, the value of t, for which $x(t) = y(t)$, is:			
 a) log₃ 4 b) log_{4/3} 2 		c) log ₄ 3 d) log ₂ 2	
11) If $^{n-1}C_r = (k^2 - 8)^n C_{r+1}$, then the range of 'k' is (Jan 202)			
a) $\sqrt{2} < k \le 3$ b) $2\sqrt{2} < k < 3$		c) $2 \le k < 3$) d) $2\sqrt{2} < k < 8$	
12) If the shortest distance between the lines $\frac{x-4}{1} = \frac{y+1}{2} = \frac{z}{-3}$ and $\frac{x-\lambda}{2} = \frac{y+1}{4} = \frac{z-2}{-5}$, is $\frac{6}{\sqrt{5}}$, then the sum of all possible values of λ is :			
a) 10	b) 5	c) 8	d) 7
13) Let $\mathbf{a} = \hat{i} + 2\hat{j} + \hat{k}$, $\mathbf{b} = 3(\hat{i} - \hat{j} + \hat{k})$. Let \mathbf{c} be the vector such that $\mathbf{a} \times \mathbf{c} = \mathbf{b}$ and $\mathbf{a} \cdot \mathbf{c} = 3$. Let $\mathbf{a} \cdot ((\mathbf{b} \times \mathbf{c}) - \mathbf{b} - \mathbf{c})$ is equal to:			
a) 24	b) 36	c) 32	d) 20
14) If A denotes the sum of all the coefficients in the expansion of $(1 - 3x + 10x^2)^n$ and B enotes the sum of all the coefficients in the expansion of $(1 + x^2)^n$, then: (Jan 2024)			
a) $A = B^3$	b) $A = 3B$	c) $B = A^3$	d) $3A = B$
15) Consider the line $L: 4x + 5y = 20$. Let two other lines are L_1 and L_2 which trisect the line L and pass through origin, then tangent of angle between lines L_1 and L_2 is (Jan 2024)			
a) $\frac{25}{41}$	b) $\frac{30}{41}$	c) $\frac{2}{5}$	d) $\frac{3}{5}$

c) symmetric and reflexive only

d) reflexive only