MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 28

Mathematics

1. The area of the region enclosed by $f(x) = \frac{-2x}{e^x}$ and the x - aixs is

A. 1 sq.units

B. 2 sq.units

C. $\frac{1}{2}$ sq. units

D. not defined

Answer: B

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2. Let $x_1, x_2, x_3 \ldots\ldots\ldots x_k$ be k observations and $w_i = ax_i + b$ for I = 1,2,3..... K , where a and b are constants . If mean of x_i is 52 and their standard deviation is 12 and mean of w_i is 60 and their standard deviation is 15, then the value of a and b should be 15, then the value of a and b should be

A. $a = 1.25, b = -5$

B. $a = -1.25, b = 5$

C. $a = 2.5, b = -5$

D. $a = 2.5, b = 5$

Answer: A

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3. For real values of x, the value of expression $\frac{11x^2 - 12x - 6}{x^2 + 4x + 2}$

A. lies between -17 and - 3

B. does not lie between -17 and -3

C. lies between 3 and 17

D. does not lie between 17 and 3

Answer: B

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4. Two distinct numbers are chosen from 1,3,5,7 ..... 151,153,155 and multiplied . The probability that the product is a multiple of 5 is

A. $\frac{1020}{3003}$

B. $\frac{1112}{3003}$

C. $\frac{1011}{3003}$

D. $\frac{1122}{3003}$

Answer: B

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5. If f(x) is a twice differentiable function such that $f''(x) = -f, f'(x) = g(x), h(x) = f^2(x) + g^2(x)$ and $h(10) = 10$, then h (5) is equal to

A. 5

B. 15

C. 10

D. 17

Answer: C

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6. The minimum value of $|3z-3|+|2z-4|$ equal to

A. 2

B. 1.5

C. 3

D. 1

Answer: A

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7. If $\lim_{x \to 0}\left(1+px+qx^2\right)^{\operatorname{cosec} x}=e^5$,then

A. $p=5, q \in R$

B. $p=5, q>R$

C. $p = 5, q \in R$

D. $q = 5, p = 0$

Answer: A

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8. If $\int e^{\sin\theta}\left(\sin\theta + \sec^2\theta\right)\mathrm{d}\theta$ is equal to $f(\theta) + C$ (where , C is the constant of integration) and f(0) = 0 , then the value of $f\left(\frac{\pi}{4}\right)$ is

A. $e^{\sqrt{2}}$

B. $e^{\frac{1}{\sqrt{2}}}$

C. e^2

D. $e^{\frac{1}{2}}$

Answer: B

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9. A curve passing through the point (1,2) and satisfying the condition that slope of the normal at any abscissa of that point , then the curve also passes through the point

A. (0,0)

B. (2,2)

C. (2,1)

D. (3,2)

Answer: C

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10. The coefficient of x^8 in the expasnsion of $\left(1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+\frac{x^8}{8!}\right)^2$ is

A. $\frac{1}{135}$

B. $\frac{2}{315}$

C. $\frac{3}{105}$

D. $\frac{1}{210}$

Answer: A

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11. Let P and Q be two points on the curves $x^2 + y^2 = 2$ and $\frac{x^2}{8} + \frac{y^2}{4} = 1$ respectively. Then the minimum value of the length PQ is

A. 1

B. $2 - \sqrt{2}$

C. $2\sqrt{2}$

D. $\sqrt{2}$

Answer: B

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12. Let orthocentre of ΔABC is (4,6) . If $A = (4, 7)$ and $B = (-2, 4)$, then coordinates of vertex C is

A. (5,4)

B. (4,5)

C. (-5,-4)

D. (-4,-5)

Answer: A

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13. The area bounded by the curve $y = \left|\cos^{-1}(\sin x)\right| + \left|\frac{\pi}{2} - \cos^{-1}(\cos x)\right|$ and the x - axis , where $\frac{\pi}{2} \leq x \leq \pi$, is equal to

A. π^2

B. $\frac{\pi^2}{2}$

C. $\frac{\pi^2}{8}$

D. $\frac{\pi^2}{4}$

Answer: D

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14. Let $\oplus$ and $\otimes$ are two mathematical operators . If $p \oplus (q \otimes r)$ is equivalent to $((p \wedge q) \Rightarrow r)$, then $\oplus$ and $\otimes$

A. can be $\vee$ and $\wedge$ respectively

B. can be $\wedge$ and $\vee$ respectively

C. can both be $\Rightarrow$

D. can be $\Rightarrow$ and $\Leftrightarrow$ respectively

Answer: C

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15. The point of intersection of the plane $3x - 5y + 2z = 6$ with the straight line passing through the origin and perpendicular to the plane $2x - y - z = 4$ is

A. (1,-1,-1)

B. (-1,-1,2)

C. (4,2,2)

D. $\left(\frac{4}{3}, \frac{-2}{3}, \frac{-2}{3}\right)$

Answer: D

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16. If $D_r = \begin{vmatrix} r & 15 & 8 \\ r^2 & 35 & 9 \\ r^3 & 25 & 10 \end{vmatrix}$, then the value of $\sqrt[5]{\left(\left(-\frac{1}{100}\right)\sum_{r=1}^{5} D_r\right) - 37}$ is equal to

A. 5

B. 2

C. 9

D. 3

Answer: D

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17. Let $I_1 = \int_0^1 e^{x^2} dx$ and $I_2 = \int_0^{12} 2^{x^2} e^{x^2} dx$ then the value of $I_1 + I_2$ is equal to

A. 1

B. 2

C. e

D. e^2

Answer: C

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18. A pair of tangents are drawn from a point P to the circle $x^2 + y^2 = 1$. If the tangents make an intercept of 2 on the line x=1 then the locus of P is

A. $y^2 = 2(x + 1)$

B. $2y^2 = -(x+1)$

C. $y^2 = 2(x-1)$

D. $y^2 = -2x+1$

Answer: A

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19. Tangents to the parabola $y^2 = 4ax$ at $P\left(at_1^2, 2at_1\right)$ and $Q\left(at_2^2, 2at_2\right)$ meet at T. If ΔPTQ is right - angled at T, then $\frac{1}{PS} + \frac{1}{QS}$ is equal to (where , S is the focus of the given parabola)

A. $\frac{1}{a}$

B. $\frac{2}{a}$

C. $\frac{1}{2a}$

D. $\frac{1}{4a}$

Answer: A

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20. The value of $\int_{-1}^{1} \cot^{-1}\left(\frac{x+x^3+x^5}{x^4+x^2+1}\right) dx$ is equal to

A. $\frac{\pi}{2}$

B. $\frac{\pi}{4}$

C. $\frac{3\pi}{4}$

D. π

Answer: D

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21. Let $\vec{U} = \hat{i}, \hat{j}, \vec{V} = \hat{i} - \hat{j}$ and $\vec{W} = 3\hat{i} + 5\hat{j} + 3\hat{k}$. If $\hat{n} = 0$ then $\left|\vec{W}.\hat{n}\right|$ is equal to

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22. Consider the function $f(x) = \max\{|\sin x|, |\cos x|\}, \forall x \in [0, 3\pi]$. if λ is the number of points at which f(x) is non - differentiable , then value of $\frac{\lambda^3}{5}$ is

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23. If the roots of the equation $10x^3 - cx^2 = 54x - 27 = 0$ are in harmonic progression the value of c is

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24. If the normal to the ellipse $\frac{x^2}{25} + \frac{y^2}{1} = 1$ is at a distance p from the origin then the maximum value of p is

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25. If $A = \begin{bmatrix} 2 & 3 \\ -1 & -2 \end{bmatrix}$ and $B = \sum_{r=1}^{10} A^r$, then the value of det (B)is equal to

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