



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 22

Mathematics

1. Let
$$I_1=\int_0^1rac{|\ln x|}{x^2+4x+1}dx$$
 and $I_2=\int_1^\inftyrac{\ln x}{x^2+4x+1}dx$, then
A. $I_1=I_2$
B. $I_1>I_2$
C. $I_1+I_2=0$
D. $I_1=2I_2$

Answer: A



2. The number of positive integral solutions of the equation

$$egin{array}{cccc} x^3+1 & x^2y & x^2z \ xy^2 & y^3+1 & y^2z \ xz^2 & z^2y & z^3+1 \end{array} ert = 11$$
 is

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3. The value of the integral
$$\int \!\! \frac{\left(x^2-4x\sqrt{x}+6x-4\sqrt{x}+1
ight)dx}{x-2\sqrt{x}+1}$$

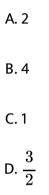
A.
$$\frac{x^{\frac{3}{2}}}{2} + x + c$$

B. $\frac{x^2}{2} - \frac{4}{3}x^{\left(\frac{3}{2}\right)} + x + c$
C. $x^{\frac{3}{2}} + \frac{x}{2} + c$
D. $\frac{2}{3}x^{\frac{3}{2}} + c$

Answer: B

4. If the solution of the differential equation $rac{dy}{dx}=rac{x^3+xy^2}{y^3-yx^2}$ is $y^k-x^k=2x^2y^2+\lambda$

(where, λ is an arbitrary constant), then the value of k is



Answer: B

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5. The number of tangents that can be drawn from (2, 0) to the curve $y=x^6$ is/are

6. The equation $kx^2 + x + k = 0$ and $kx^2 + kx + 1 = 0$ have exactly one root in common for

A.
$$k=-rac{1}{2},1$$

B. $k=1$
C. $k=-rac{1}{2}$
D. $k=rac{1}{2}$

Answer: C



7. The terms $\tan 80^\circ, \tan 70^\circ + \tan 10^\circ$ and $\tan 10^\circ$ are in

A. artithmetic progression

- B. geometric progression
- C. harmonic progression

D. none of these

Answer: A



8. If $a^2 + b = 2$, then maximum value of the term independent of x in the

expansion of
$$\left(ax^{rac{1}{6}}+bx^{-rac{1}{3}}
ight)^{2}$$
 is $(a>0;b>0)$

A. 48

B. 84

C. 42

D. 168

Answer: B



9. The number of even numbers of four digits that can be formed using

the digits 0, 1, 2, 3, 4 and 5 is

A. 180

B. 156

C. 144

D. 198

Answer: B

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10. If
$$f: R o A$$
 defined as $f(x) = an^{-1} \Big(\sqrt{4 \big(x^2 + x + 1 \big)} \Big)$ is

surjective, then A is equal to

A.
$$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$$

B. $\left[0, \frac{\pi}{2}\right)$
C. $\left[\frac{\pi}{3}, \frac{\pi}{2}\right)$
D. $\left(0, \frac{\pi}{3}\right]$

Answer: C

11. If the line y = x - 1 bisects two chords of the parabola $y^2 = 4bx$ which are passing through the point (b, -2b), then the length of the latus rectum can be equal to

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12. The centre of the circule passing through the points of intersection of

the curves (2x+3y+4)(3x+2y-1)=0 and xy=0 is

A.
$$\left(\frac{5}{6}, -\frac{5}{12}\right)$$

B. $\left(-\frac{5}{6}, -\frac{5}{12}\right)$
C. $\left(\frac{5}{12}, -\frac{5}{6}\right)$
D. $\left(-\frac{5}{12}, \frac{5}{6}\right)$

Answer: B

13. If $x = \sec t + \tan t$ and $y = \sec t - \tan t$, where t is a parameter, then the value of $\frac{dy}{dx}$ when $x = \frac{1}{\sqrt{3}}$ is

A. 0

B.-3

C. $\sqrt{3}$

D.
$$\frac{1}{\sqrt{3}}$$

Answer: B

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14. Let p, q and r be three statements. Consider two compound statements $S_1 : (p \Rightarrow q) \Rightarrow r \equiv p \Rightarrow (q \Rightarrow r)$ $S_2 : (p \Leftrightarrow q) \Leftrightarrow r \equiv p \Leftrightarrow (q \Leftrightarrow r)$ State in order, whether S_1, S_2 are true of false. (where, T represents true F represents false) A. TT

B. TF

C. FT

D. FF

Answer: C

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15. Let the equations of side BC and the internal angle bisector of angle B of ΔABC are 2x-5y+a=0 and y+x=0 respectively. If A=(2,3) , then the value of of a is equal to

A. 4

B. 2

 $\mathsf{C}.-2$

 $\mathsf{D.}-4$

Answer: D



16. The mean and variance of 20 observations are found to be 10 and 4 respectively. On rechecking, it was found that an observation 8 is incorrect. If the wrong observation is omitted, then the correct variance is

A. 7

B.
$$\frac{100}{16}$$

C. $\frac{1400}{361}$
D. $\frac{1440}{361}$

Answer: D

17. A box contains 9 slips bearing numbers -3, -2, -1, 0, 1, 2, 3, 4 and 5. An experiment consists of drawing a slip from this box and replacing it back in the box after noting the number. This experiment is repeated 9 times. This experiment is repeated 9 times. These 9 numbers are now chosen as elements of 3×3 matrix, then the probability that the matrix is skew symmetric is

A.
$$\frac{1}{9^{6}}$$

B. $\frac{343}{9^{9}}$
C. $\frac{1}{9^{9}}$
D. $\frac{1}{9^{7}}$

Answer: B

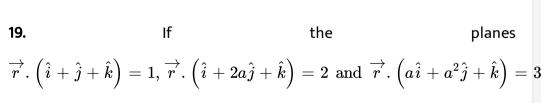


18. If A and B are non - singular matrices of order three such that $adj(AB) = \begin{bmatrix} 1 & 1 & 1 \\ 1 & \alpha & 1 \\ 1 & 1 & \alpha \end{bmatrix} \text{ and } |B^2adjA| = \alpha^2 + 3\alpha - 8 \text{, then the value}$

of α is equal to

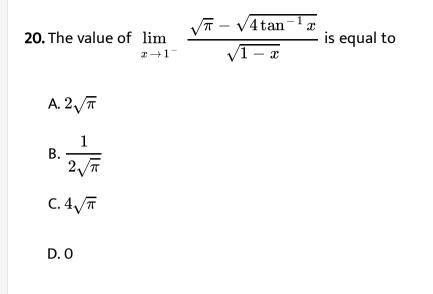
A. $\frac{9}{5}$ B. $\frac{8}{5}$ C. 3 D. 2

Answer: A



intersect in a line, then the possible number of real values of a is

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Answer: D



21. The area (in sq. units) bounded by the curve $y=~\max$. $\left(x^3,x^4
ight)$ and

the x - axis from x = 0 to x = 1 is

22. A vertical tower subtends an angle of 60° at a point on the same level as the foot of the tower. On moving 100 m further from the first point in line with the tower, it subtends an angle of 30° at the point. If the height of the tower is Hm, then the value of $\frac{H}{25\sqrt{3}}$ (in meters) is

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23. If the arguments of $(1-i)ig(\sqrt{3}+iig)ig(1+\sqrt{3}iig)$ and $(Z-2)ig(\overline{Z}-1ig)$

are equal, then the locus to Z is part of a circle with centre (a, b). The 1

value of
$$\frac{1}{a+b}$$
 is

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24. Let
$$\overrightarrow{a} = \hat{i} + 2\hat{j} + 3\hat{k}$$
,
 $\overrightarrow{b} = 2\hat{i} + 3\hat{j} + \hat{k}, \overrightarrow{c} = \hat{k} + \hat{i} \text{ and } (\overrightarrow{x} \times \overrightarrow{b}) = (\overrightarrow{a} \times \overrightarrow{c}) \times \overrightarrow{b}$. If
 $\overrightarrow{x} \cdot \overrightarrow{a} = 0$, then $|\overrightarrow{x}|$ is equal to use $\sqrt{3} = 1.73$)

25. Let
$$f(x) = \begin{cases} a , x = \frac{\pi}{2} \\ \frac{\sqrt{2x-\pi}}{\sqrt{9+\sqrt{2x-\pi}-b}} & , x > \frac{\pi}{2} \end{cases}$$
 If $f(x)$ is continuous at $x = \frac{\pi}{2}$, then the value of $\frac{a^2}{5b}$ is Watch Video Solution