



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 67

Mathematics

1. The value of $\sin \left\{ \cot^{-1} \left[\cos \left(\cot^{-1} \left(\frac{1}{x} \right) \right) \right] \right\}$ is equal to $(x > 0)$

A. $\sqrt{\frac{1+x^2}{2+x^2}}$

B. $\sqrt{\frac{1-x^2}{2+x^2}}$

C. $\sqrt{\frac{1+x^2}{2-x^2}}$

D. $\sqrt{\frac{2+x^2}{1+x^2}}$

Answer: A



Watch Video Solution

2. The integral $I = \int_0^{100\pi} [\tan^{-1} x] dx$ (where, $[.]$ represents the greatest integer function)

has the value $K(\pi) + \tan(p)$ then value of

$K + p$ is equal to

A. 101

B. 99

C. 100π

D. 99π

Answer: B



Watch Video Solution

3. Which of the following functions is injective ?

A. $f(x) = x^2 + 3, x \in (-\infty, \infty)$

B. $f(x) = |x + 1|, x \in [2, \infty)$

C. $f(x) = (x - 4)(x - 5), x \in (\infty, 5]$

D. $f(x) = \frac{4x^2 + 3x - 5}{4 + 3x + 5x^2}, x \in (-\infty, \infty)$

Answer: B



Watch Video Solution

4.

Let

$$A = \begin{bmatrix} 2 & 0 & 7 \\ 0 & 1 & 0 \\ 1 & -2 & 1 \end{bmatrix} \text{ and } B = \begin{bmatrix} -k & 14k & 7k \\ 0 & 1 & 0 \\ k & -4k & -2k \end{bmatrix}$$

. If $AB = I$, where I is an identity matrix of order 3, then the sum of all elements of matrix B is equal to

A. 2

B. $\frac{3}{7}$

C. $\frac{10}{3}$

D. 4

Answer: D



Watch Video Solution

5. The length of the major axis of the ellipse

$$(5x - 10)^2 + (5y + 13)^2 = \frac{(3x - 4y + 7)^2}{4} \text{ is}$$

- A. $\frac{10}{3}$ units
- B. $\frac{10}{\sqrt{3}}$ units
- C. $\frac{20}{3}$ units
- D. $\frac{5}{\sqrt{3}}$ units

Answer: D



Watch Video Solution

6. The quadratic equations $x^2 - 6x + a = 0$ and $x^2 + cx + 6 = 0$ have one root in common. The other roots of the first and second equations are integers in the ratio 4 : 3. Then the common root is

A. 4

B. 3

C. 2

D. 1

Answer: C



Watch Video Solution

7. The 5^{th} and the 31^{th} terms of an arithmetic progression are, respectively 1 and -77 . If the K^{th} term of the given arithmetic progression is -17 , then the value of K is

A. 12

B. 10

C. 11

D. 13

Answer: C



Watch Video Solution

8. General solution of the equation

$$4 \cot 2\theta = \cot^2 \theta - \tan^2 \theta \text{ is } \theta =$$

A. $n\pi \pm \frac{\pi}{4}$

B. $n\pi \pm \frac{\pi}{3}$

C. $2n\pi \pm \frac{\pi}{3}$

D. $2n\pi \pm \frac{\pi}{6}$

Answer: A



Watch Video Solution

9. Let $f(x) = \begin{cases} 1 + \sin x & x < 0 \\ x^2 - x + 1 & x \geq 0 \end{cases}$

A. $x = 0$ is a point of local maxima

B. $2f(0) = 1$ has no real solution in

$$x \in (0, \infty)$$

C. $f(x)$ is increasing in $x \in (2, \pi)$

D. $f(x)$ is increasing in $x \in \left(0, \frac{1}{2}\right)$

Answer: D



Watch Video Solution

10. The arithmetic mean of a set of 50 numbers is 38. If two numbers of the set, namely 60 and

40 discarded, the arithmetic mean of the remaining set of numbers is

A. 38.5

B. 37.5

C. 36.5

D. 36

Answer: B



Watch Video Solution

11. The area bounded by $y = \max(x^2, x^4)$, $y = 1$ and the y -axis from $x = 0$ to $x = 1$ is

A. 3 sq. units

B. $\frac{3}{2}$ sq. units

C. $\frac{2}{3}$ sq. units

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

Answer: C



Watch Video Solution

12. the solution of the differential equation

$$\frac{dy}{dx} = ax + b, a \neq 0 \text{ represents}$$

- A. a parabola
- B. an ellipse
- C. a circle
- D. a hyperbola

Answer: A



Watch Video Solution

13. If \vec{m} , \vec{n} are non - parallel unit vectors and \vec{r} is a vector which is perpendicular to \vec{m} and \vec{n} such that

$$|\vec{r}| = 5 \text{ and } |\vec{m} + \vec{n}|^2 = 2 + 4|\vec{m} \times \vec{n}|,$$

then the value of $|\begin{bmatrix} \vec{m} & \vec{n} & \vec{r} \end{bmatrix}|^2$ is equal to

A. 7

B. $\frac{21}{5}$

C. 5

D. $\frac{10}{3}$

Answer: C



14. Let AB be the line of intersection of the planes P_1 and P_2 :

$$P_1: 3y + z + 1 = 0 \text{ and } P_2: 2x - y + 3z - 7 = 0$$

and the equation of line AB is

$$\frac{x - 1}{2} = \frac{y - 3}{-1} = \frac{z - 4}{3} \text{ in 3D space.}$$

Shortest distance between the line of intersection of planes P_1 and P_2 and the line

AB is equal to

A. $\frac{7}{\sqrt{10}}$ units

B. $7\sqrt{\frac{2}{5}}$ units

C. $\frac{6}{\sqrt{10}}$ units

D. $2\sqrt{\frac{2}{5}}$ units

Answer: B



Watch Video Solution

15. Let $A = \begin{bmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{bmatrix}$ and matrix B is

defined such that $B = A + 3A^2 + 3A^3 + A^4$.

If $|B| = 8$ then the number of values of α in

$[0, 10\pi]$ is

A. 10

B. 12

C. 5

D. 3

Answer: A



Watch Video Solution

16. $\sim(p \vee q) \vee (\sim p \wedge q)$ is equivalent to

A. p

B. $\sim p$

C. q

D. $\sim q$

Answer: B



Watch Video Solution

17. If the area of the rhombus enclosed by the lines $x \pm y \pm n = 0$ be 2 square units, then

A. $n^2 = 4$

B. $n^2 = 2$

C. $n^2 = \frac{1}{2}$

D. $n^2 = 1$

Answer: D



Watch Video Solution

18. The equation of a normal to the parabola $y = x^2 - 6x + 6$ which is perpendicular to the line joining the origin to the vertex of the parabola is

A. $4x - 4y - 11 = 0$

B. $4x - 4y + 1 = 0$

C. $4x - 4y - 21 = 0$

D. $4x - 4y + 21 = 0$

Answer: C



Watch Video Solution

19. If in the expansion of $\left(2^x + \frac{1}{4^x}\right)^n$, $\frac{T_3}{T_2} = 7$

and the sum of the co-efficients of *2nd* and *3rd*

terms is 36, then the value of x is

A. $\frac{1}{2}$

B. $-\frac{1}{2}$

C. $-\frac{1}{4}$

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

Answer: D



Watch Video Solution

20. Find x and y if

$$(x^4 + 2xi) - (3x^2 + yi) = (3 - 5i) + (1 + 2yi)$$

A. $x = 2, y = 3$

B. $x = -2, y = \frac{1}{3}$

C. $x = \pm 2$ and $y = 3, \frac{1}{3}$

D. None of these

Answer: C



Watch Video Solution

21. If $2f(x + y) = f(x) \cdot f(y)$ for all real x, y .

where $f'(0) = 3$ and $f(4) = 25$, then the

value of $f'(4)$ is equal to



Watch Video Solution

22. If the number of 7 digit numbers whose sum of the digits is equal to 10 and which is formed by using the digits 1, 2 and 3 only is K, then the value of $\frac{K + 46}{100}$ is



Watch Video Solution

23. If the integral

$$I = \int e^{5 \ln x} (x^6 + 1)^{-1} dx = \ln(x^6 + 1) + C,$$

(where C is the constant of integration) then

the value of $\frac{1}{\lambda}$ is



[Watch Video Solution](#)

24. Vipin and Shubham are playing a game with a coin, that comes up heads with a probability p . They take turns flipping the coin until one of them wins, with Vipin going first. Vipin wins if he flips heads and Shubham wins if he flips a heads and Shubham wins if he flips a tails. Given that the probability of Vipin winning the

game is $\frac{1}{2}$, then the value of p is $k \sin^2 162^\circ$.

The value of $\frac{k}{10}$ is equal to



[Watch Video Solution](#)

25. If the circle $(x - a)^2 + y^2 = 25$ intersects the circle $x^2 + (y - b)^2 = 16$ in such way that the length of the common chord is 8 units, then the value of $a^2 + b^2$ is



[Watch Video Solution](#)