MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 64

Mathematics

1. If

$$\left(1+x+2x^2\right)^{20}=a_0+a_1x+a_2x^2+\ldots+a_{40}x^{40}$$

.

The value of $a_0 + a_2 + a_4 + \ldots + a_{38}$ is

A. $2^{20}\left(2^{20}+1\right)$

B. $2^{20}\left(2^{20}+1\right)$

C. $2^{39} - 2^{19}$

D. $2^{39} + 2^{19}$

Answer: C

Watch Video Solution

2. The number of natural numbers n for which the equation $(x-8)x=(n-10)$ has no real solutions equal to

A. 2

B. 3

C. 4

D. 5

Answer: D

Watch Video Solution

3. Sum of n terms of the series $\frac{1^4}{1.3}+\frac{2^4}{3.5}+\frac{3^4}{5.7}+\ldots.$ is equal to

A. $\frac{n(n+1)\left(2n^2+n+1\right)}{6(2n+1)}$

B. $\frac{(n+1)\left(n^2+1\right)}{6(2n+1)}$

C. $\frac{(n+1)\left((2n+1)^2+1\right)}{8(2n+1)}$

D. $\frac{n(n+1)\left((2n+1)^2+1\right)}{16(2n+1)}$

Answer: B

Watch Video Solution

4. If A and B are matrices with 24 and 40 elements respectively, then the number of possible orders of A and B such that AB is defined is

A. 2

B. 3

C. 4

D. 8

Answer: C

 Watch Video Solution

5. Let ABCD be a quadrilateral in which AB is parallel to CD and perpendicular to AD, AB = 3CDand the area of the quadrilateral is 4 square units. If a circle can be drawn touching all the sides of the quadrilateral, then its radius is:

A. 1

B. $\sqrt{5}$

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer: D

Watch Video Solution

6. If the mean of a set of observations $x_1, x_2, \ldots, x_n$ is $\overline{X}$, then the mean of the observations $x_i + 2i, i = 1, 2, \ldots, n$ is

A. $brx + 2(n+1)$

B. $\bar{x} + (n+1)$

C. $\bar{x} + \dfrac{n+1}{2n}$

D. None of these

Answer: B

Watch Video Solution

Watch Video Solution

7. If the range of $f(x) = \tan^1 x + 2\sin^{-1} x + \cos^{-1} x$ is $[a, b]$, then

A. $a = \frac{\pi}{4}$

B. $a = -\frac{\pi}{2}$

C. $b = \frac{5\pi}{4}$

D. $b = \frac{3\pi}{2}$

Answer: C

Watch Video Solution

Watch Video Solution

8. The tops of two poles of height 40 m and 25 m are connected by a wire. If the wire makes an angle 30° with the horizontal, then the length of the wire is

A. 30 m

B. 20 m

C. 15 m

D. 25 m

Answer: A

Watch Video Solution

9. The equation of the image of line $y = x$ wire respect to the line mirror $2x - y = 1$ is

A. $y = 7x - 5$

B. $y = 7x - 6$

C. $y = 3x - 7$

D. $y = 6x - 5$

Answer: B

Watch Video Solution

10. The value of $\lim_{x \to \infty} \left[\frac{1^{\frac{1}{x}} + 2^{\frac{1}{x}} + 3^{\frac{1}{x}} + \ldots + 10^{\frac{1}{x}}}{10} \right]^{10x}$ is

A. $10!$

B. 10

C. $9!$

D. 0

Answer: A

Watch Video Solution

11. Two mutually perpendicular tangents of the parabola $y^2 = 4ax$ at the points Q_1 and Q_2 on it meet its axis in P_1 and P_2. If S is the focus of the parabola, then the value of $\left(\frac{1}{SP_1} + \frac{1}{SP_2}\right)^{-1}$ is equal

A. $\frac{a}{4}$

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

C. a

D. 2a

Answer: C

Watch Video Solution

12. If $\int_0^1 x^{11} e^{-x^{24}} dx = A$, and $\int_0^1 x^3 e^{-x^8} dx = B$, then the relation between A and B is

A. $A = 3B$

B. $B = 3A$

C. $A + 3B = 0$

D. $B + 3A = 0$

Answer: B

Watch Video Solution

Watch Video Solution

13. Consider a square matrix A or order 2 which has its elements as 0, 1, 2, 4. If the absolute value of $|A|$ is least then, then absolute value of $|adj(adj(A))|$ is equal to

A. 0

B. 2

C. 1

D. 4

Answer: B

Watch Video Solution

14. If $f(x) = \begin{cases} \frac{e^{[2x]+2x+1}-1}{[2x]+2x+1} & : \quad x \neq 0 \\ 1 & : \quad x = 0 \end{cases}$, then (where $[.]$ represents the greatest integer function)

Watch Video Solution

15. Consider the line $L \equiv \frac{x-1}{2} = \frac{y+2}{3} = \frac{z-7}{6}$. Point $P(2, -5, 0)$ and Q are such that PQ is

perpendicular to the line L and the midpoint of PQ lies on line L, then coordinates of Q are

A. $(-4, -5, 2)$

B. $(-3, 0, 1)$

C. (1, 6, 2)

D. (1, 5, 7)

Answer: A

Watch Video Solution

16. If three fair dice are thrown and the sum is an odd number, then the probability that all the three dice show an odd number is

A. $\frac{3}{4}$

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

C. $\frac{5}{6}$

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

Answer: D

Watch Video Solution

17. If the integral $I = \int \frac{dx}{x^{10} + x} = \lambda \ln\left(\frac{x^9}{1 + x^{\mu}}\right) + C$, (where, C is the constant of integration) then the value of $\frac{1}{\lambda} + \mu$ is equal to

A. 81

B. $\frac{82}{9}$

C. 18

D. 8

Answer: C

Watch Video Solution

18. The locus of the mid - points of the parallel chords with slope m of the rectangular hyperbola $xy = c^2$ is

A. $y + mx = 0$

B. $y - mx = 0$

C. $my - x = 0$

D. $my + x = 0$

Answer: A

Watch Video Solution

19. If $y = mx + 5$ is a tangent to $x^3y^3 = ax^3 + by^3$ at point (1, 2), then the value of a is equal to

A. $\frac{9}{5}$

B. $\frac{16}{5}$

C. $\frac{9}{4}$

D. $\frac{18}{7}$

Answer: B

Watch Video Solution

20. The differential equation $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$ represents the arc of a circle in the second and the third quadrant and passing through $\left(-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$. Then, the radius (in units) of the circle is

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

B. $\frac{1}{4}$

C. 2

D. 1

Answer: D

Watch Video Solution

Watch Video Solution

21. If $\frac{3+\cot 80^\circ \cot 20^\circ}{\cot 80^\circ + \cot 20^\circ} = \tan. \frac{\pi}{k}$, then the value of k is (where, $\frac{\pi}{k}$ is an acute angle)

Watch Video Solution

22. If z is a complex number, then the area of the triangle (in sq. units) whose vertices are the roots of the equation $z^3 + iz^2 + 2i = 0$ is equal to (where, $i^2 = -1$)

Watch Video Solution

23. A point (α, β, γ) satisfies the equation of the plane $3x + 4y + 7z = 3$. The value of β, such that $\overrightarrow{p} = \alpha\hat{i} + \beta\hat{j} + \gamma\hat{k}$ satisfies the relation $\hat{j} \times \left(\hat{j} \times \overrightarrow{p}\right) = \overrightarrow{0}$, is equal to

Watch Video Solution

24. The value fo the integral $I = \int_0^{\infty} \frac{dx}{(1 + x^{2020})(1 + x^2)}$ is equal to $k\pi$, then the value of 16k is equal to

Watch Video Solution

25. The number of ordered pairs of positive integers (a, b), such that their Least Common Multiple is the given positive integer $7^2 \times 11^3 \times 19^4$, is equal to

Watch Video Solution