



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 100

Mathematics

1. The value of x for which for fourth term in the expansion of $\left(5^{\left(\frac{2}{5}\right)\log_5\sqrt{4^x+44}} + \frac{1}{5^{\log_5\sqrt[3]{2^{x-1}+7}}}\right)^8$ is

336 can be equal to

A. $\frac{1}{2}$	
B. 1	
C. 2	
D. 3	

Answer: A

Watch Video Solution

2. Let
$$\lim_{x \to 0} rac{\sin 2x}{ an\left(rac{x}{k}
ight)} = L_1 ext{ and } \lim_{x \to 0} rac{e^{2x}-1}{x} = L_2,$$

and the value of L_1L_2 is 8, then k is

A. 4

B. 8

C. 6

D. 2



3. The area (in sq. units) bounded between
$$y = 6 \sin x$$
 and $y + 8 \sin^3 x = 0$ from $x = 0$ to $x = \pi$ is

A. 10π

B.
$$\frac{34\pi}{3}$$

C. 8
D. $\frac{68}{3}$



4. If
$$\tan 25^\circ = a$$
, then the value of $\frac{\tan 205^\circ - \tan 115^\circ}{\tan 245^\circ + \tan 335^\circ}$ in terms of a is

A.
$$rac{1-a^2}{1+a^2}$$

B.
$$rac{1-a}{2a}$$

C. $rac{2a}{1+a^2}$
D. $rac{1+a^2}{1-a^2}$

Answer: D



5. The equation of the line which intersect each of
the two lines
$$2x + y - 1 = 0 = x - 2y + 3z$$
 and
 $3x - y + z + 2 = 0 = 4x + 5y - 2z - 3 = 0$ and
is parallel to $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ is

A. 4x + 7y - 6z - 1 = 0 = 2x - 7y + 4z + 3

B.
$$4x + 7y - 6z - 4 = 0 = 2x - 7y + 4z + 2$$

C.
$$4x + 7y - 6z - 3 = 0 = 2x - 7y + 4z + 7$$

D. 4x + 7y - 6z + 7 = 0 = 2x - 7y + 4z - 3

Answer: C

Watch Video Solution

6. The locus of mid - points of all chords of parabola $y^2 = 4x$, for which all cirlces drawn taking them as diameters passes through the vertex of the parabola is a conic whose length of the smallest focal chord is equal to A.1 units

B. 2 units

C. 3 units

D. 4 units

Answer: B

Watch Video Solution

7. An exam consists of 3 problems selected randomly from a collection of 10 problems. For a student to pass, he needs to solve correctly at least two of three problems. If the student knows to solve exactly

5 problems, then the probability that the students

pass the exam is

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

B. $\frac{1}{3}$
C. $\frac{3}{4}$
D. $\frac{5}{6}$



8. If the matrix $A=egin{bmatrix}2&5\\1&3\end{bmatrix}$, then the value of $rac{|A^{100}+A^{98}|}{|A^{20}+A^{18}|}$ is equal to

A. 0

B. 1

C. 2

D. 3

Answer: B



9. Let $f(x) = rac{x(3^x-1)}{1-\cos x}$ for x
eq 0. Then value of

f(0), which make f(x) continuous at x = 0, is

A.
$$\log 3$$

B. $\frac{1}{2}\log 3$
C. $\frac{1}{2\log 3}$

D.
$$2\log 3$$



10. The total number of divisors of the number $N=2^5.3^4.5^{10}.7^6$ that are of the form $4K+2, \ orall K\in N$ is equal to

A. 385

B. 384

C. 96

D. 77

Answer: B

11. The value of $\sin^{-1}\sin 17 + \cos^{-1}\cos 10$ is equal to

A. 27

 $\mathsf{B.}-27$

C. $17-5\pi$

D. $9\pi-27$



12. For any two sets A and B, the values of $\left[(A-B) \cup B
ight]^C$ is equal to

A. $A^C \cap B^C$

 $\mathsf{B.}\, A \cup B$

C.A - B

 $\mathsf{D}.\,B-A$



13. Tangents are drawn to a unit circle with centre at the origin from each point on the line 2x + y = 4. Then the equation to the locus of the middle point of the chord of contact is

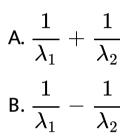
A.
$$\frac{\pi}{4}$$

B. $\frac{\pi}{16}$
C. $\frac{\pi}{8}$
D. $\frac{\sqrt{2\pi}}{8}$

Answer: C



14. A straight line L cuts the sides AB, AC, AD of a parallelogram ABCD at B_1, C_1, d_1 respectively. If $\overrightarrow{AB_1} = \lambda_1 \overrightarrow{AB}, \overrightarrow{AD_1} = \lambda_2 \overrightarrow{AD}$ and $\overrightarrow{AC_1} = \lambda_3 \overrightarrow{AC}$, then $\frac{1}{\lambda_3}$ equal to



$$\mathsf{C}.-\lambda_1+\lambda_2$$

D.
$$\lambda_1+\lambda_2$$



15. If eccentricity of the ellipse $\frac{x^2}{a^2+1} + \frac{y^2}{a^2+2} = 1$ is $\frac{1}{\sqrt{6}}$, then the ratio of the length of the latus rectum to the length of the major axis is

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

B.
$$\frac{3}{\sqrt{6}}$$

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

D.
$$\frac{2}{\sqrt{6}}$$



16. If the cubic equation $z^3+az^2+bz+c=0\,orall a,\,b,\,c\in R,\,c
eq 0$ has a purely imaginary root, then (where $i^2=-1$)

A.
$$c = ab$$

B. b = ac

C. the imaginary root is equal to $\pm ic$

D. the imaginary root is equal to $\pm ia$



17. If the integral $I_n=\int_0^{rac{\pi}{2}}rac{\sin(2n-1)x}{\sin x}dx$, Then the value of $\left[I_{20}
ight]^3-\left[I_{19}
ight]^3$ is

A. 400

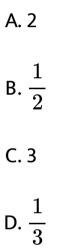
B. 200

C. 361

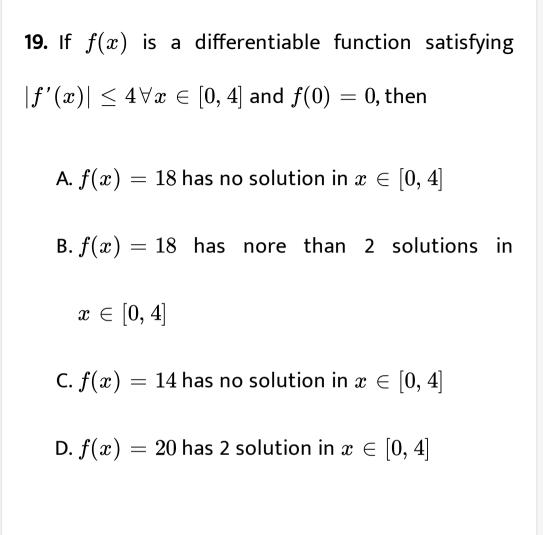
D. 0



18. In an arithmetic progression the $(p+1)^{
m th}$ term is twice the $(q+1)^{
m th}$ term. If its $(3p+1)^{
m th}$ term is λ times the $(p+q+1)^{
m th}$ term, then λ is equal to







Answer: A

20. The equation of the curve satisfying the differential equation $\frac{dy}{dx} + 2\frac{y}{x^2} = \frac{2}{x^2}$ and passing through $\left(\frac{1}{2}, e^4 + 1\right)$ is

A.
$$y=e^{2x}+1$$

$$\mathsf{B}.\, y=e^{\frac{2}{x}}-1$$

C.
$$y=1+e^{rac{2}{x}}$$

D.
$$y=1+e^{-x}$$

Answer: C

21. The product of a 9×4 matrix and a 4×9 matrix contains a variable x in exactly two places. If D(x) is the determinant of the matrix product such that D(0) = 1, D(-1) = 1 and D(2) = 7, then D(-2) is equal to

Watch Video Solution

22. If the mean of 50 observation is 25 and their standard deviation is 4 and the sum of the squares of all the observations is λ , then $\frac{\lambda}{1000}$ is

23. If the point M(h,k) lie on the line 2x + 3y = 5such that |MA - MB| is maximum where (1, 2) and B(2, 3), then the value of (h + k) is

Watch Video Solution

24. The indefinite integral

$$I = \int \frac{\sec^2 x \tan x (\sec x + \tan x) dx}{(\sec^5 x + \sec^2 x \tan^3 x - \sec^3 x \tan^2 x - \tan^5 x)}$$
simplifies to $\frac{1}{3} \ln|f(x)| + c$, where
 $f\left(\frac{\pi}{4}\right) = 2\sqrt{2} + 1$ and c is the constant of
integration. If the value of $f\left(\frac{\pi}{3}\right)$ is $a + \sqrt{b}$, then
the value of $b - 3a$ is equal to

Colution

Watch Video

25. The total number of solutions of the equation

 $\sin x an 4x = \cos x$ for all $x \in (0,\pi)$ are

