



MATHS

BOOKS - NTA MOCK TESTS

NTA TPC JEE MAIN TEST 70

Mathematics

1. Suppose that f and g are function such that

(i)
$$g(x)=f^{\,\prime}(x)$$
 and

(ii) f''(x) = -f(x)

If $h(x) = f^2(x) + g^2(x)$ satisfies h(0)=2010

then the value of $hig(\sqrt{\pi}ig)$ is

A. 0

B.1

C. 2010

D. None of these

Answer: C



2. The point at shortest distance from the line x+y=7 and lying on an eillipse $x^2+2y^2=6$, has coordinates

A.
$$(\sqrt{2}, \sqrt{2})$$

B. $(0, \sqrt{3})$
C. $(2, 1)$
D. $(\sqrt{5}, \frac{1}{\sqrt{2}})$

Answer: C

3. Let x,y,z and w be whole numbers. Then the number of 4 digit numbers xyzw that can be formed such that x < y and z > w is

A. 1, 008

B. 1, 296

C. 1, 620

D.2,025

Answer: C



4. p:57 is an odd prime number.

q:8 is divisor of 24.

r:12 is L.C.M of 5 and 3 are three logical statements, then which one of the following is false?

A. $p \lor (~q \land r)$ B. $~p \lor (q \land r)$ C. $(p \land)v \sim r$ D. $(p \lor q) \land \sim r$

Answer: A

5. IF $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is to be the square root of order two unit matrix, then α , β and γ should satisfy the relation

A.
$$1+lpha^2+eta\gamma=0$$

B. $1-lpha^2-eta\gamma=0$
C. $1-lpha^2+eta\gamma=0$
D. $lpha^2+eta\gamma-1=0$

Answer: D

6. The equation of the common tangent to the parabolas $y^2 = 4ax$ and $x^2 = 4$ by is given by

A.
$$xa^{1\,/\,3} + yb^{1\,/\,3} + a^{2\,/\,3}b^{2\,/\,3} = 0$$

B.
$$xb^{1/3} + ya^{1/3} + a^{2/3}b^{2/3} = 0$$

C. $x^{1/3} + y b^{1/3} - a^{2/3} b^{2/3} = 0$

D. None of the

Answer: A



7. The range of a such that the line $\left(\log_2\left(1+5a-a^2
ight)
ight)x-5y-a^2-5$ is =0 a

normal to the curve xy = 1 is

A. $(\,-\infty,\,0)$

 $\mathsf{B}.\,(5,\infty)$

C.(0,5)

D. None of these

Answer: C



8. If $a,b,c\in R^+$ such that a+b+c=27and maximum value of $a^2b^3c^4=2^m imes 3^n$ m, then the sum of six A.M.'s between m and n is

A. 66

B. 132

C. 120

D. 176

Answer: A



9. If 12 identical balls are to be placed randomly in 3 identical boxes, then the probability that one of the boxes contains exactly 3 balls is

A.
$$\frac{4}{19}$$

B. $\frac{55}{3} \left(\frac{2}{3}\right)^{11}$
C. $\frac{(428)^{12}C_3}{3^{11}}$

D. $\frac{5}{19}$

Answer: C

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10. The minimum distance of the curve $y^2=2x^3+9-3x^2$ from point Q(1,0) is

A. 2

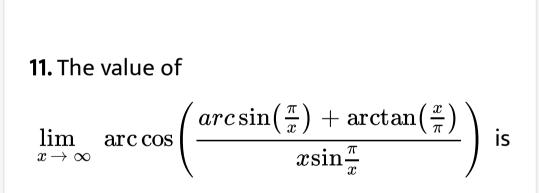
B. $2\sqrt{2}$

$\mathsf{C.}\,4\sqrt{2}$

D. 8

Answer: B





equal to

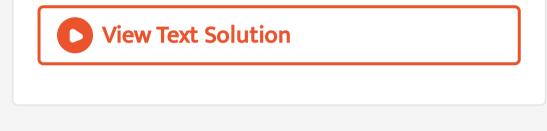
A.
$$\frac{\pi}{3}$$

B. $\frac{\pi}{6}$

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

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

Answer: A



12. Let
$$f(x) = \max \{\cos x, x, x^2\}$$
 in

 $-3 \leq \ \leq 3$ then

A. f(x) is continuous everywhere but not

differentiable at exactly 3 ponts

B. f(x) is continuous everywhere but not

differentiable at exactly 2 points

C. f(x) is not differentiable at 4 points

D. None of these

Answer: A

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13. The value of
$$\int x^3 \sqrt{3+5x^4}$$
 dx equals

A.
$$rac{1}{30}ig(3+5x^4ig)^{3\,/\,2}+c$$

B.
$$rac{1}{20}ig(3+5x^4ig)^{1/2}+c$$

C. $rac{1}{20}ig(3+5x^4ig)^{3/2}+c$
D. $rac{1}{30}ig(3+5x^4ig)^{1/2}+c$

Answer: A



14. If in a $\Delta ABC, \angle C = 90^{\circ},$ then value of an(A-B) is

A.
$$rac{\left|a^2+b^2
ight|}{2ab}$$

B.
$$\frac{|a^2 - b|}{2ab}$$
C.
$$\frac{c^4}{2ab}$$
D.
$$\frac{ca}{2b}$$

Answer: B

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15. The slope of the tangent to a cruve y = f(x) at (x, f(x)0 is 2x + 1.If the curve passes through the point (1,2) then the area of

the region bounded by the curve, the x-axis

and the lien x=1 is

A.
$$\frac{5}{6}$$
 sq. units
B. $\frac{6}{5}$ sq.units
C. $\frac{1}{6}$ sq. units

D. 6 sq. units

Answer: A



16. In $\Delta ABC, \angle a = rac{\pi}{6}$ then the maximum value of $\sin^2 B + \sin^2 C$ is

A.
$$\sqrt{3} - 1$$

B. $1 + \frac{\sqrt{3}}{2}$
C. $\frac{3}{2}$
D. $2 - \frac{\sqrt{3}}{2}$

Answer: B

17. If
$$\sin^{-1}\Bigl(rac{x}{5}\Bigr) + \sec^{-1}\Bigl(rac{5}{3}\Bigr) = rac{\pi}{2}$$
 the a

value of x is

A. 1

B. 2

C. 3

D. 4

Answer: C

18. Find the quartile deviation of daily wages (in Rs.) of 7 persons given below: Wages is Rs. 12,7,15,10,17,17,25

A. 14.5

B. 5

C. 9

D. 4.5

Answer: B



19. The solution of the curves $rac{xdx+ydx}{xdy-ydx}=\sqrt{rac{1-x^2-y^2}{x^2+y^2}}$ are

A. circles passing through the origin

B. parabola

C. circles of radius $\frac{1}{2}$ through the origin

D. not circle

Answer: C

Let $R = \{(x, y) : x, y \in N$ and 20. $\{x^2-4xy+3y^2=0\}$ where N is the set of all natural numbers. Then the relation R is A. reflexive but neither symmetric nor transitive B. Symmetric and transitive C. reflexive and symmetric.

D. reflexive and transitive

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Answer: D

21. The sumof the coefficients of even powers of x in the binomial expansion of $(1 + x + x^2 + x^3)^5$ is View Text Solution

22. A is a square matrix of order n

I=m maximum number of distinct entries if A is

a triangular matrix,

m=maxmum numberof distinct entries if A is a

diagonal matrix,

p=minimum number of zerois if A is a triangular matrix,

If l-p=2m-5, then the order of the

matrix is ...

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23. Let a,b are two integers such that $a, b \in \{1, 2, 3, 4, 5, 6, \}$ then the number of ordered pairs of (a,b) which satisfy the equation $\left(\frac{a^x + b^x}{2}\right)^{\frac{2}{x}} = 6$ is



24. A plane P is perpendicular to the vector $\vec{A} = 2\hat{i} + 3\hat{j} + 6\hat{k}$ and cotains the point $B(\hat{i} + 5\hat{j} + 3\hat{k})$. Then find square of the pependicular disance from the origin to the plane P.



25. In a triangle ABC $2\hat{i} + \hat{j}$, $5\hat{i} + \hat{j} \& 2\hat{i} + 7\hat{j}$ be the position vectors of points A,B& C respectively. Let $\overrightarrow{AB}, \overrightarrow{AB} \& \overrightarrow{AC}$ are non coplanar vectors. If M is minimum integral value of $\left(\overrightarrow{AD}\right)^2 + \left(\overrightarrow{BD}\right)^2 + \left(\overrightarrow{CD}\right)^2$ then

sum of digits of M is

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26. Let |z-2-3i|=1 and the greatest value of |z| is $r+\sqrt{c}$ then the value of

$$\sqrt{r+c+2}$$
 is

27. If
$$F(a) = \int_0^1 \frac{\sin(\pi + Ina^x)dx}{x}$$
 and $a > 0$, then $\left|\lim_{a \to 1} F'(a)\right| =$

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28. If the minimum distance between the curves

$$y = \cos^{-1} \left(\frac{(x^2 - 4x + 5)\sin^{-1}(1 - x)}{\cot^{-1}(\cos^{-1}(3 - x))} \right)$$

& $(x - 8)^2 + (y - \pi)^2 = 1$ is equal to α then
the value of $\frac{25}{\alpha}$ is

29. The ratio in which the line joining the points (-1,1) and (5,7) is divided by the line x + y = 1 is $1: \alpha$ then the value of α is .

30. Let k are roots of equation $8x^3 + 1001x + 2008 = 0$, then the value of $(r+s)^3 + (s+t)^3 + (t+r)^3$ is 7k3 (where k is at ten's place). Then k=