

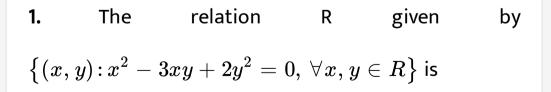


MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 36

Mathematics



A. reflexive but not symmetric

B. symmetric but not transitive

C. symmetric and transitive

D. an equivalence relation

Answer: A

2. If
$$I_n - \int (\ln x)^n dx$$
, then $I_{10} + 10I_9$ is equal to (where C is the constant of integration)

A.
$$x(\ln x)^{10}+C$$

B.
$$10(\ln x)^9 + C$$

$$\mathsf{C}.\,9{(\ln x)}^{10}+C$$

$$\mathsf{D}.\,x(\ln x)^9+C$$

Answer: A



3. If p and q are two logical statements, then $p \Rightarrow (q \Rightarrow p)$ is equivalent to

A.
$$p \Rightarrow (p \Rightarrow q)$$

$$\texttt{B.}\,p \Rightarrow (p \lor q)$$

$$\mathsf{C}.\,p \Rightarrow (p \wedge q)$$

$$\mathsf{D}.\,p \Rightarrow (p \Leftrightarrow q)$$

Answer: B



4. Let α and β be the roots of the equation $x^2 + ax + 1 = 0, a \neq 0$. Then the equation whose roots are $-\left(\alpha + \frac{1}{\beta}\right)$ and $-\left(\frac{1}{\alpha} + \beta\right)$ is

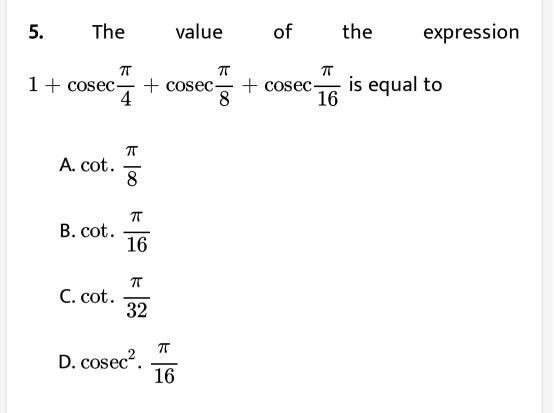
A.
$$x^2=0$$

$$\mathsf{B.}\,x^2 - 2ax + 4 = 0$$

$$\mathsf{C.}\,x^2 - 2ax + 4 = 0$$

D.
$$x^2 - ax + 1 = 0$$

Answer: C



Answer: C



6. Let $\overrightarrow{p} 2\hat{i} + \hat{j} - 2\hat{k}, \overrightarrow{q} = \hat{i} + \hat{j}$. If \overrightarrow{r} is a vector such that \overrightarrow{p} . $Vecr = \left|\overrightarrow{r}\right|, \left|\overrightarrow{r} - \overrightarrow{p}\right| = 2\sqrt{2}$ and the angle between $\overrightarrow{p} \times \overrightarrow{q}$ and \overrightarrow{r} is $\frac{\pi}{6}$, then the value of $\left|\left(\overrightarrow{p} \times \overrightarrow{q}\right) \times \overrightarrow{r}\right|$ is equal to

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

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

D. 3

Answer: A



7. The solution of the differential equation $x\cos y {dy\over dx} + \sin y = 1$ is (Here, x>0 and λ is an

arbitrary constant)

A. $x - x \cos x = lamdba$

$$\mathsf{B.}\,x + x\cos x = \lambda$$

C.
$$x-x\sin y=\lambda$$

D.
$$x+x\cos y=\lambda$$

Answer: C



 $|z_1| = 1, |z_2| = 2, |z_3| = 3$ and $z_1 + z_2 + z_3 = 3 + \sqrt{5}i$, then the value of $Re(z_1\overline{z_2} + z_2\overline{z_3} + z_3\overline{z_1})$ is equal to (where z_1, z_2 and z_3 are complex numbers)

A. 1

 $\mathsf{B.}-1$

$$\mathsf{C}.-rac{1}{2}$$

D. 0

Answer: D



9. If from the top of a tower 80 meters high the angles of depression of the top and bottom of a house are 30° and 45° respectively, then the height of the house is

A. $40\sqrt{3}$ meters B. $40\left(\frac{\sqrt{3}-1}{\sqrt{3}}\right)$ meters C. $80\left(\frac{\sqrt{3}-1}{\sqrt{3}}\right)$ meters D. $40\left(\frac{\sqrt{3}+1}{\sqrt{3}}\right)$ meters

Answer: C



10. The radius of circle, touching the parabola $y^2=8x$

at (2, 4) and passing through (0, 4), is

A. 1 unit

B. 2 units

C. $\sqrt{2}$ units

D. $\sqrt{3}$ units

Answer: C



11. Distance between two non - intersecting planes

 P_1 and P_2 is 5 units, where P_1 is

2x-3y+6z+26=0 and P_2 is 4x+by+cz+d=0. The point A(-3,0,-1) lies between the planes P_1 and P_2 , then the value of 3b+4c-5d is equal to

A. 580

B. 120

C. -18

 $\mathsf{D.}-120$

Answer: B

12. Let $Z = \begin{bmatrix} 1 & 1 & 3 \\ 5 & 1 & 2 \\ 3 & 1 & 0 \end{bmatrix}$ and $P = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 0 \\ 3 & 0 & 1 \end{bmatrix}$. If $Z = PQ^{-1}$, where Q is a square matrix of order 3, then the value of Tr((adjQ)P) is equal to (where Tr(A) represents the trace of a matrix A i.e. the sum of all the diagonal elements of the matrix A and adjB represents the adjoint matrix of matrix B)

- A. 3
- B. -1
- C. 4

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

Answer: B



13.	The	sum	of	10	terms	of	the	series
$1+2(1.1)+3(1.1)^2+4(1.1)^3+\dots$ is								
	A. 85.12							
	B. 92.5							
	C. 96.5							
I	D. 100							

Answer: D



14. The coefficient of x^4 in the expansion of $(1 + x + x^2)^6$ is A. 72 B. 90 C. 96 D. 112

Answer: B



15. The tangent at any point on the curve xy = 4 makes

intercepls on the coordinates axes as a and b. Then

the value of ab is

A. 8

B. 16

C. 32

D. 64

Answer: B



16. The number of ways in which 10 boys can be divied into 2 groups of 5, such that two tallest boys are in two different groups, is equal to

A. 70

B.35

C. 252

D. 126

Answer: A



17. The value of
$$\int_{3}^{6} rac{\sqrt{\left(36-x^2
ight)^3}}{x^4} dx$$
 is equal to A. $rac{\pi}{2}$ B. $rac{\pi}{6}$

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

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

Answer: C

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18. The line $(K+1)^2x + Ky - 2K^2 - 2 = 0$ passes through the point (m, n) for all real values of K, then

A.
$$m+n=2$$

$$\mathsf{B}.\,m-n=6$$

C.
$$rac{m}{n}=2$$

D. $rac{m}{n}=rac{1}{2}$

Answer: B



19. If A and B are non - singular matrices of order 3×3 , such that A = (adjB) and B = (adjA), then det (A) + det(B) is equal to (where det(M)represents the determinant of matrix M and adj M represents the adjoint matrix of matrix M)

A. 1

B. 2

C. 3

D. 4

Answer: B

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20. Line $L_1 \equiv 3x - 4y + 1 = 0$ touches the cirlces C_1 and C_2 . Centres of C_1 and C_2 are $A_2(1, 2)$ and $A_2(3, 1)$ respectively, then identify the INCORRECT statement from the following statements.

A. L_1 is direct common tangent of these circles B. L_1 is transverse common tangent to these

circles

C. Radius of circle C_1 is $\frac{4}{5}$ units D. Radius of circle C_2 is $\frac{6}{5}$ units

Answer: A

21. If
$$\lim_{x \to \infty} \frac{ae^x + b\cos x + c + dx}{x\sin^2 x} = 3$$
, then the value of $272 \frac{abd}{c^3}$ is equal to
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22. A purse contains 10 ten rupee coins and 5 five rupee coins. Two coins are randomly drawn. If the expected value of 2 drawn coins is λ , then $\frac{9\lambda}{4}$ is equal

to



23. If
$$f(x) = \begin{cases} \frac{(2^x - 1)^2 \tan 3x}{x \sin^2 x} : & 0 < x < \pi/6 \\ \lambda : & x = 0 \end{cases}$$
 is continuous at x = 0, then the value of $\frac{10\sqrt{3\lambda}}{\ln 2}$ is equal

to

24. If
$$f \colon R o (0, \pi/2], f(x) = \sin^{-1} igg(rac{40}{x^2 + x + \lambda} igg)$$

is a surjective function, then the value of λ is equal to

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25. If $f: R \to R$ is a function defined as $f(x^3) = x^5, \ \forall x \in R - \{0\}$ and f(x) is differentiable $\forall x \in R$, then the value of $\frac{1}{4}f'(27)$ is equal to (here f' represents the derivative of f)