



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 69

Mathematics

1. Let $P_1: x + y + 2z = 3$ and $P_2: x - 2y + z4$ be two planes. Let A(2, 45) and B(4, 3, 8) be two points in space. The equation of plane P_3 through the line of intersection of P_1 and P_2 such that the length of the projection upon it of the line segment AB is the least, is A. 2x - y + 3z = 7

B.
$$3y + z + 1 = 0$$

C.
$$x+3y+z+2=0$$

D. 3x - 3y + 4z - 11 = 0

Answer: A

Watch Video Solution

2. If
$$A = \begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$$
, where $A^x = O$ (where, O is

a null matrix and $x < 15, x \in N$) then which of the following is true?

A. Greatest value of x is 13

B. Sum of the values of x is 102

C. Difference between the largest and the smallest

value of x is 10

D. Number of values of x is 7

Answer: B

3. The area (in sq. units) bounded by
$$y=\max\left(\sin^2x,\sin^4x
ight),x\in\left[0,rac{\pi}{2}
ight]$$
 with the x - axis, from $x=0$ to $x=rac{\pi}{2}$ is

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

C. $\frac{\pi}{4}$
D. $\frac{\pi}{6}$

Answer: C



4. A box contains 1 black and 1 white ball. A ball is drawn randomly and replaced in the box with an additional ball of the same colour, then a second ball is drawn randomly from the box containing 3 balls. The probability that the first drawn ball was white given that at least one of the two balls drawn was white is

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

B. $\frac{3}{4}$
C. $\frac{4}{5}$
D. $\frac{5}{11}$

Answer: B



5. The number of real solution of
$$\cot^{-1}\sqrt{x(x+3)} + \sin^{-1}\sqrt{x^2+3x+1} = \frac{\pi}{2}$$
 is /are A. O

B. 1

C. 2

D. infinite

Answer: A



6. Suppose the family of lines ax + by + c = 0 (where a, b, c are in artihmetic progression) be normal to a family of circles. The radius of the circle of the family which intersects the circle $x^2 + y^2 - 4x - 4y - 1 = 0$ orthogonally is

A.
$$2\sqrt{2}$$
 units

B.2 units

C. $3\sqrt{2}$ units

D. 4 units

Answer: A

Watch Video Solution

7. If the function $f(x)=rac{\sin 3x+a \sin 2x+b}{x^3}, x
eq 0$ is continuous at x=0 and $f(0)=K, \, orall K\in R$, then b-a is equal to

A. 4

$$\mathsf{B.}\;\frac{5}{2}$$

C. 5

Answer: D

Watch Video Solution

8. If x = 6 and
$$y = -2$$
 then $x - 2y = 9$. The contrapositive of this statement is

A. If
$$x-2y
eq 9$$
 then $x
eq 6 \,\, {
m or} \,\, y
eq -2$

B. If
$$x-2y
eq 9$$
 then $x
eq 6~ ext{and}~y
eq -2$

C. If
$$x - 2y = 9$$
 then $x = 6$ and $y = -2$

D. None of these

Answer: A



9. The point on the ellipse $16x^2 + 9y^2 = 400$, where the ordinate decreases at the same rate at which the abscissa increases is (a, b), then a + 3b can be

A. 16

B. 19

C. 6

D. 9

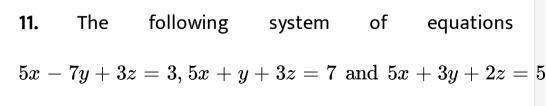
Answer: B



10. The integral $I=\int_{e}^{e+1}rac{1+x^2}{1+x^3}dx$ satisfies

- A. I>2
- $\mathsf{B}.\, I > e$
- $\mathsf{C}.\,I<0$
- $\mathrm{D.}\,I<1$

Answer: D



A. Consistent with trivial solution

B. Consistent with a unique non trivial solution

C. Consistent with infinite solutions

D. Inconsistent with no solution

Answer: B

Watch Video Solution

12. The order of the differential equation of the family of curves $y = \frac{a}{c}\sin(bx) + 3^{dx}$ where a, b, c, d are arbitrary constants is B. 3

C. 2

D. 1

Answer: B

O Watch Video Solution

13. The sum of the rational terms in the expansion of

$$\left(\sqrt{2}+\sqrt[5]{3}
ight)^{10}$$
 is

A. 31

B. 41

C. 51

D. 61

Answer: B



14. A committee of 12 members is to be formed from 9 women and 8 men. The number of ways of forming the committee with women in majority is

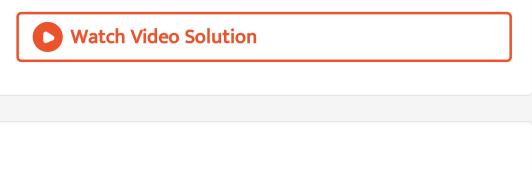
A. 1008

B. 2702

C. 6062

D. 2352

Answer: B



15. If both the roots of the equation $4x^2 - 2x + m = 0$ lie in the interval (-1, 1), then

A.
$$-3 < m < -2$$

$$\mathsf{B.0} < m < 2$$

C.
$$2 < m < rac{5}{2}$$

D. $-2 < m \leq rac{1}{4}$

Answer: D

16. The number of solutions in the interval $[0, \pi]$ of the equation $\sin^3 x \cos 3x + \sin 3x \cos^3 x = 0$ is equal to

A. 7

B. 6

C. 5

D. 4

Answer: C



17. Let A(2, 0) and B(-2, 0) are two fixed vertices of ΔABC . If the vertex C moves in the first quadrant in such a way that $\cot A + \cot B = 2$, then the locus of the point C is

A. y = 2

B. x = 4

 $\mathsf{C}.\,x=2$

D. y = 1

Answer: A

18. For two data sets, each with size 5, the variances are given to be 3 and 4 and the corresponding means are given 2 and 4, respectively. The variance of the combined data set is

A.
$$\frac{11}{2}$$

B. $\frac{9}{2}$
C. $\frac{13}{2}$
D. $\frac{5}{2}$

Answer: B

19. If a tangent having slope 2 of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is normal to the circle $x^2 + y^2 + bx + 1 = 0$, then the value of $4a^2 + b^2$ is equal to

A. 4

B. 2

C. 16

D. 8

Answer: C



20. If $lpha,eta\in C$ are the distinct roots of the equation $x^2-x+1=0$, then $lpha^{101}+eta^{107}$ is equal to

A. 2

B. - 1

C. 0

D. 1

Answer: D



21. The volume of a tetrahedron determined by the vectors \overrightarrow{a} , \overrightarrow{b} , \overrightarrow{c} is $\frac{3}{4}$ cubic units. The volume (in cubic

units) of a tetrahedron determined by the vectors
$$3\left(\overrightarrow{a}\times\overrightarrow{b}\right), 4\left(\overrightarrow{b}\times c\right)$$
 and $5\left(\overrightarrow{c}\times\overrightarrow{a}\right)$ will be

Watch Video Solution

22. The value of
$$\lim_{x o 0} \left(rac{(1-\cos 4x)(5+\cos x)}{x \tan 5x}
ight)$$
 is

equal to

Watch Video Solution

23. If
$$I = \int \frac{1+x^4}{(1-x^4)^{\frac{3}{2}}} dx = \frac{1}{\sqrt{f(x)}} + C$$
 (where, C is the constant of integration) and $f(2) = \frac{-15}{4}$, then the value of $2f\left(\frac{1}{\sqrt{2}}\right)$ is

24. If x,y are positive real numbers and 3x + 4y = 5, then

the lagest possible value of $16x^2y^3$ is

Watch Video Solution

25. Let the radius of the circle touching the parabola $y^2 = x$ at (1, 1) and having the directrix of $y^2 = x$ at (1, 1) and having the directrix of $y^2 = x$ as its normal is equal to $k\sqrt{5}$ units, then k is equal to