MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 65

Mathematics

1. The coefficient of x^8 in the expansion of $\left(1+x+x^2+x^3\right)^4$ is

A. 30

B. 31

C. 32

D. 36

Answer: B

Watch Video Solution

2. There are 7 distinguishable rings. The number of possible five - rings arrangements on the four fingers (except the thumb) of one hand (the order of the rings on each finger is to be counted and it is not required that each finger has a ring is equal to

A. 214110

B. 211410

C. 124110

D. 141120

Answer: D

Watch Video Solution

3. If $\tan^2(x+y)+\cot^2(x+y)=1-2x-x^2,$ then (where, $n \in Z$)

A. $x=1, y=n\pi \pm \frac{\pi}{4}-1$

B. $x = -1, y = n\pi \pm \frac{\pi}{4} + 1$

C. $x = -1, y = \frac{n\pi}{2} \pm \frac{\pi}{4} - 1$

D. $x = +1, y = \frac{n\pi}{2} \pm \frac{\pi}{4} - 1$

Answer: B

Watch Video Solution

4. For two sets A and B, if $n(A) = 7, n(B) = 13$ and $n(A \cap B) = 5$, then the incorrect statement is

A. $n(A \cup B) = 15$

B. $n(A - B) = 6$

C. $n(A \times B) = 91$

D. $n\{(A \cup B) \times (A \cap B)\} = 75$

Answer: B

Watch Video Solution

5. The value of $\lim_{x \to \frac{\pi}{2}} \frac{\left[\frac{x}{3}\right]}{\ln(\sin x)}$ (where, $[.]$ denotes the greatest integer function)

A. does not exist

B. is equal to 1

C. is equal to 0

D. is equal to -1

Answer: C

Watch Video Solution

6. Let $g(x) = xf(x)$, where $f(x) = \begin{cases} x^2 \sin. \frac{1}{x} & : & x \neq 0 \\ 0 & : & x = 0 \end{cases}$. At $x = 0$,

A. g is differentiable but g' is not

B. g is differentiable while f is not differentiable

C. both f and g are non differentiable

D. g is differentiable and g' is continuous

Answer: D

Watch Video Solution

7. Equivalent statement of the statement "If $9 > 10$ then $3^2 = 5$" will be

A. If $3^2 = 5$ then $9 > 10$

B. $9 < 10$ and $3^2 \neq 5$

C. $9 < 10$ or $3^2 = 5$

D. None of these

Answer: D

Watch Video Solution

8. Let A be the foot of the perpendicular from the origin to the plane $x - 2y + 2z + 6 = 0$ and $B(0, -1, -4)$ be a point on the plane. Then, the length of AB is

A. $\sqrt{13}$ units

B. $\sqrt{15}$ units

C. 4 units

D. $\sqrt{17}$ units

Answer: A

Watch Video Solution

9. Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ are three non - collinear vectors in a plane such that $\left|\vec{a}\right| = 2, \left|\vec{b}\right| = 5$ and $\left|\vec{c}\right| = \sqrt{29}$. If the angle between $\vec{a}$ and $\vec{c}$ is θ_1 and the angle between $\vec{b}$ and $\vec{c}$ is θ_1 the angle between $\vec{b}$ and $\vec{c}$ is θ_2, where $\theta_1, \theta_2 \in \left[\frac{\pi}{2}, \pi\right]$, then the value of $\theta_1 + \theta_2$ is equal to

A. $\frac{7\pi}{6}$

B. $\frac{4\pi}{6}$

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

D. $\frac{7\pi}{4}$

Answer: C

Watch Video Solution

10. If the system of equations $2x - 3y + 5z = 12, 3x_y + pz = q$ and $x - 7y + 8z - 17$ is consistent, then which of the following is not true?

A. $p = 2, q = 7$

B. $p \neq 2, q = 7$

C. $p \neq 2, q \neq 7$

D. $p = 2, q \neq 7$

Answer: A

Watch Video Solution

11. If Ais symmetric and B is skew-symmetric matrix, then which of the following is/are CORRECT ?

A. ABA^T is a symmetric matrix

B. $AB^T + BA^T$ is a symmetric matrix

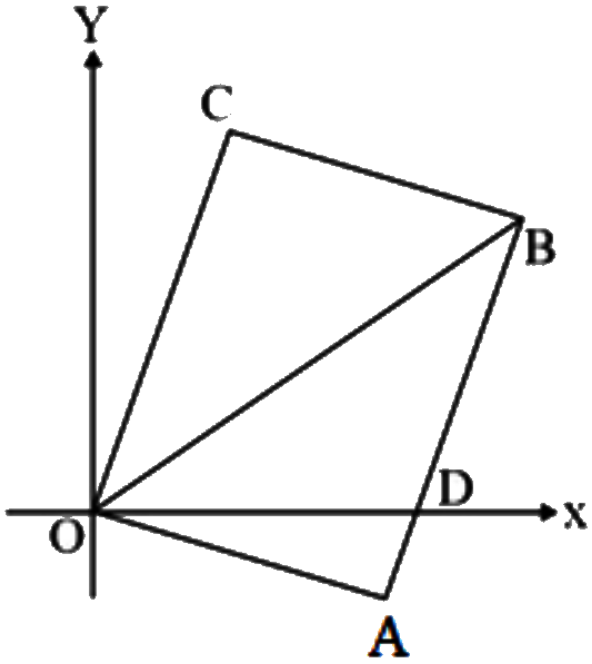
C. $(A + B)(A - B)$ is a skew symmetric matrix

D. $(A + I)(B - I)$ is a skew symmetric matrix

Answer: B

Watch Video Solution

12. In the figure shown, OABC is a rectangle with $OA = 3$ units, OC = 4 units. If BD = 2.5 units, then the slope of the diagonal OB is equal to



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

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

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

D. $\frac{1}{3}$

Answer: C

Watch Video Solution

13. The line $2x - y + 1 = 0$ touches a circle at the point (2, 5) and the centre of the circle lies on $x - 2y = 4$. The diameter (in units) of the circle is

A. $6\sqrt{5}$

B. $10\sqrt{3}$

C. $4\sqrt{5}$

D. $10\sqrt{2}$

Answer: A

Watch Video Solution

14. The locus of the point (x, y) whose distance from the line $y = 2x + 2$ is equal to the distance from (2, 0), is a parabola with the length of latus rectum same as that of the parabola $y = Kx^2$, then the value of K is equal to

A. $\frac{\sqrt{5}}{12}$

B. $\frac{\sqrt{5}}{4}$

C. $\frac{4}{\sqrt{5}}$

D. $\frac{12}{\sqrt{5}}$

Answer: A

Watch Video Solution

15. Let α and β be the roots of $x^2 + x + 1 = 0$, then the equation whose roots are α^{2020} and β^{2020} is

A. $x^2 + x + 1 = 0$

B. $x^2 - x - 1 = 0$

C. $x^2 + x - 1 = 0$

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

Answer: A

Watch Video Solution

16. Let the integral $I = \int \frac{(2020)^{x+\sin^{-1}(2020)^x}}{\sqrt{1-(2020)^{2x}}}dx = K^2(202)^{\sin^{-1}(2020)^x} + \lambda$ (where, λ is constant of integration), then the value of 2020^K is

A. 2020

B. 2019

C. e

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

Answer: C

Watch Video Solution

17. The integral $I = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \sin^6 x dx$ is satisfies

A. $I > \frac{\pi}{2}$

B. $I > \frac{\pi}{4}$

C. $I \in \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$

D. $I \in \left(\frac{\pi}{32}, \frac{\pi}{4}\right)$

Answer: D

Watch Video Solution

18. The general solution of the differential equation $\frac{dy}{dx} = 2y\tan x + \tan^2 x, \forall x \in \left(0, \frac{\pi}{2}\right)$ is $yf(x) = \frac{x}{2} - \frac{\sin(2x)}{4} + C$, (where, C is an arbitrary constant). If $\left(\frac{\pi}{4}\right) = \frac{1}{2}$, then the value of $f\left(\frac{\pi}{3}\right)$ is equal to

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

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

C. 2

D. 4

Answer: B

Watch Video Solution

19. If two points are taken on the mirror axis of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$ at the same distance from the centre as the foci, then the sum of the sequares of the perpendicular distance from these points on any tangent to the ellipse is

A. 25

B. 18

C. 50

D. 80

Answer: C

Watch Video Solution

20. If $(-3, -1)$ is the largest interval in which the function $f(x) = x^3 + 6x^2 + ax + 2$ is decreasing, then $[a]$ is equal to (where, $[.]$ denotes the greatest integer function)

A. 8

B. 9

C. 10

D. 11

Answer: B

Watch Video Solution

21. Let $f_i(x) = \sin(2p_i x)$ for $i = 1, 2, 3 \& p_i \in N$. If is given that the fundamental periods of $f_1(x) + f_2(x) + f_3(x), f_1(x) + f_2(x)$ and $f_1(x) + f_3(x)$ are $\pi, \frac{\pi}{3}$ respectively, then the minimum value of $p_1 + p_2 + p_3$ is

Watch Video Solution

22. For any positive n, let $f(n) = \frac{4n + \sqrt{4n^2 - 1}}{\sqrt{2n+1} + \sqrt{2n-1}}$. Then $\left(\frac{\Sigma_{k=1}^{40} f(k)}{100}\right)$ is equal to

Watch Video Solution

23. If $\cos^{-1}\left(x - \frac{x^2}{2} + \frac{x^3}{4} - \ldots\right) + \sin^{-1}\left(x^2 - \frac{x^4}{2} + \frac{x^6}{4} - \ldots.\right) = \frac{\pi}{2}0$, then x is equal to

Watch Video Solution

24. A fair coin is tossed once. If it shows head, then 2 fiar disc are thrown simultaneously otherwise 3 fair disc are thrown simultaneously. The probability that all the dice show different numbers is k, then 180 k is equal to

Watch Video Solution

25. The area bounded by $|x| + |y| = 1$ and $y \geq x^2$ in the first quadrant is $a - \frac{a^2}{2} - \frac{a^3}{3}$ sq. units, then the value of $(2a+1)^2$ is equal to

Watch Video Solution