



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 87

Mathematics

1. In the expansion of
$$\left(3\sqrt{rac{a}{b}}+3\sqrt{rac{b}{\sqrt{a}}}
ight)^{21}$$
 , the term

containing same powers of a & b is

A. 11^{th}

 $\text{B.}\,13^{\rm th}$

C. $12^{\rm th}$

 $\mathsf{D.}\,6^{th}$

Answer: B

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2. The least value of $n(n \in N)$, such that the function $f(n,x)=\int\!\!n\cos(nx)dx$ satisfies $f\!\left(n,rac{\pi}{2}
ight)=-1$, is (given, f(n,0)=0)

A. 3

B. 4

C. 5

D. 6

Answer: A

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3. Find the set of all possible real value of a such that the inequality $(x-(a-1))ig(x-ig(a^2+2ig)ig)<0$ holds for all $x\in(-1,3)$.

A. $(1,\infty)$

 $\mathsf{B.}\,(\,-\infty,\,-1)$

 $\mathsf{C.}\left(-\infty,1
ight)$

D.(0,1)

Answer: B



4. The area (in sq. units) of the circle touching the line x + y = 4 at (1, 3) and intersecting $x^2 + y^2 = 4$ orthogonally is equal to

A.
$$\frac{9\pi}{8}$$

B. $\frac{7\pi}{8}$
C. $\frac{5\pi}{4}$
D. $\frac{4\pi}{3}$

Answer: A



- 5. Consider a function $f \colon R o R$ defined by
- $f(x)=x^3+4x+5$, then
 - A. f is one one but not onto
 - B. f is onto but not one one
 - C. f is one one and onto
 - D. f is neither one one nor onto



6. Let
$$A = \begin{bmatrix} -4 & -3 & -3 \\ 1 & a & 1 \\ 4 & b & 3 \end{bmatrix}$$
 and $A = A^{-1}$, then

a+2b is equal to

A. 0

B. 4

C. 8

D. 5



7. An unbiased die is rolled n times. Let P(A), P(B) and P(C) be the probability of occurrence of an odd number exactly one, two and three times respectively in n trials. If P(A), P(B), P(C) are in arithmetic progression, then n is equal to

A. 4

B. 5

C. 6

D. 7

Answer: D



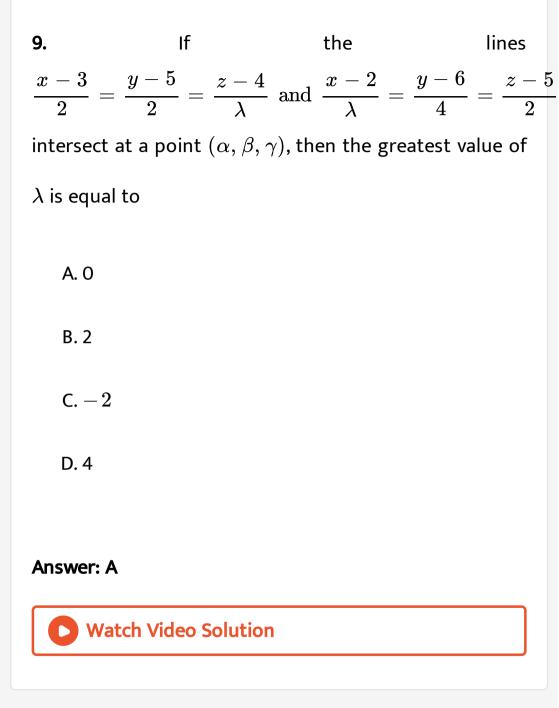
8. Let $A=ig[a_{ij}ig]_{3 imes 3}$	be	а	square	matrix	such	th	at
$AA^T=4I, A <0.$							lf
$egin{array}{c ccccccccccccccccccccccccccccccccccc$	$a_{13} \\ a_{23} \\ a_{33} +$	4	$=5\lambda A$	I+I .	Then	λ	is
equal to							

A.
$$\frac{4}{5}$$

B. $-\frac{4}{5}$
C. $\frac{8}{5}$
D. $-\frac{8}{5}$

Answer: D





10. Let $f:(-1,1) \to R$ be a function defind by f(x)=max. $\left\{ -|x|, -\sqrt{1-x^2} \right\}$. If K is the set of all points at which f is not differentiable, then K has set of all points at which f is not differentiable, then K has exactly

A. one element

B. two elements

C. five elements

D. three elements

Answer: C

11. Number of ordered pairs (a, x) satisfying the equation $\sec^2(a+2)x + a^2 - 1 = 0; \; -\pi < x < \pi$ is A. 1 B. 2 C. 3 D. 4 Answer: C Watch Video Solution

12. Which of the following option is incorrect?

Answer: C

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13. The value of
$$2\cos^{-1}\sqrt{\frac{2}{3}} - 2\cos^{-1}$$
. $\frac{\sqrt{6}+1}{2\sqrt{3}}$ is

equal to

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

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

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

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

Answer: A

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14. If a tangent drawn at $Pig(lpha,lpha^3ig)$ to the curve $y=x^3$ meets it again at $Qig(eta,eta^3ig)$, then 2eta+lpha is equal to

A. 0

 $\mathrm{B.}-3\alpha$

C. 3α

D. 4α

Answer: B



15. The slope of normal at any point P of a curve (lying in the first quadrant) is reciprocal of twice the product of the abscissa and the ordinate of point P. Then, the equation of the curve is (where, c is an arbitrary constant)

A.
$$y^2 = x + c$$

B. $y = ce^{-x^2}$
C. $y = ce^{-x}$
D. $y^2 = \ln x + c$

Answer: B



16. A shopkeeper has 11 copies each of nine different books, then the number of ways in which atleast one book can be selected is

- A. $9^{11} 1$
- B. $10^{10} 1$
- $C. 11^9 1$
- D. 10^{9}



17. Let $|z_1|=3, |z_2|=2$ and $z_1+z_2+z_3=3+4i$. If the real part of $(z_1\overline{z_2}+z_2\overline{z_3}+z_3\overline{z_1})$ is equal to 4, then $|z_3|$ is equal to (where, $i^2=-1$)

A. 1

B. 2

C. 3

D. 4

Answer: B

18. From a point P, two tangents PA and PB are drawn to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$. If the product of the slopes of these tangents is 1, then the locus of P is a conic whose eccentricity is equal to

B. 2

A. 1

C. $\sqrt{2}$

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



19. If $\sin 2A = \frac{1}{2}$ and $\sin 2B = -\frac{1}{2}$, then which of the following is false?

A.
$$\sin(A+B)$$
 may be 0

B. $\cos(A - B)$ may be 0

C. sin(A + B) or cos(A - B) is zero

 $\mathsf{D.}\sin(A+B)=0$

Answer: D



20. Let B and C are the points of intersection of the parabola $x = y^2$ and the circle $y^2 + (x-2)^2 = 8$. The

perimeter (in units) of the triangle OBC, where O is the

origin, is

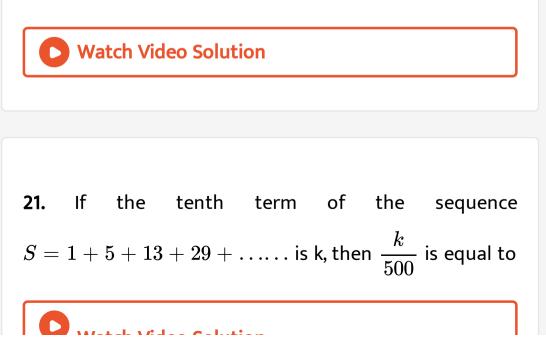
A. 8

B. $4\sqrt{5}$

 $\mathsf{C.}\,4\sqrt{5}+2$

D. $4\left(\sqrt{5}+1\right)$

Answer: D



22. In a $\triangle ABC$, the sides BC, CA and AB are consecutive positive integers in increasing order. Let \overrightarrow{a} , \overrightarrow{b} and \overrightarrow{c} are position vectors of the vertices A, B and C respectively. If $(\overrightarrow{c} - \overrightarrow{a})$. $(\overrightarrow{b} - \overrightarrow{c}) = 0$, then the value of $|\overrightarrow{a} \times \overrightarrow{b} + \overrightarrow{b} \times \overrightarrow{c} + \overrightarrow{c} \times \overrightarrow{a}|$ is equal to

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23. The value of
$$\lim_{x o rac{5\pi}{4}} rac{\cot^3 x - \tan x}{\cos\left(x - rac{5\pi}{4}
ight)}$$
 is equal to

24. The area bounded by $f(x) = \begin{cases} \sin(2x) & x \ge 0\\ \cos(2x) & x < 0 \end{cases}$ with the x - axis, $x = -\frac{\pi}{4}$ and $x = \frac{\pi}{4}$ is k square

units. Then, the value of 4k is equal to

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25. Let in $\triangle ABC$ the coordinates of A are (0, 0). Internal

angle bisector of $\angle ABC$ is x-y+1=0 and mid -

point of BC is (-1, 3). Then, the ordinate of C is