



MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 109

Mathematics

1. Let $f(x) = -x^2 + x + p$, where p is a real number. If g(x) = [f(x)] and g(x) is discontinuous at $x = \frac{1}{2}$, then p - cannot be

(where [.] represents the greatest integer

function)

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

B. $\frac{3}{4}$
C. $\frac{7}{4}$
D. $-\frac{1}{4}$

Answer: A

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2. If n(A) denotes the number of elements in

set A and if n(A) = 4, n(B) = 5 and $n(A \cap B) = 3$ then $n[(A imes B) \cap (B imes A)] =$

A. 8

B. 9

C. 10

D. 11

Answer: B



3. The number of integers for which the equation $\sin^{-1}x + \cos^{-1}x + \tan^{-1}x = n$ has real solution(s) is

A. 0

B. 1

C. 2

D. 3

Answer: D



4. If the straight line y = x meets y = f(x) at P, where f(x) is a solution of the differential equation $\frac{dy}{dx} = \frac{x^2 + xy}{x^2 + y^2}$ such that f(1) = 3, then the value of f'(x) at the point P is

A. $\frac{3}{5}$ B. $\frac{5}{3}$ C. 2

D. 1

Answer: D



5. Two whole numbers are randomly chosen and multiplied, then the chance that their product is divisible by 5 is

A.
$$\frac{4}{25}$$

B. $\frac{9}{25}$
C. $\frac{16}{25}$
D. $\frac{1}{25}$

Answer: B



6. The minimum value of p for which the lines 3x - 4y = 2, 3x - 4y = 12, 12x + 5y = 7and 12x + 5y = p constitute the sides of a rhombus is

A. 33

B. 19

D. 9

Answer: C

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7. The coefficient of x^6 in the expansion of $(1-x)^8(1+x)^{12}$ is equal to

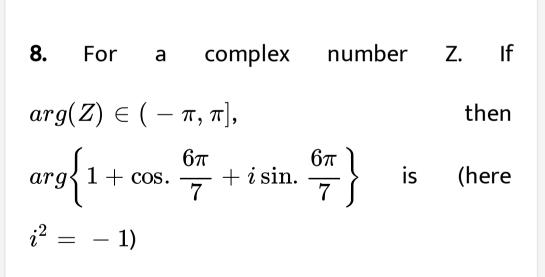
A. 168

B. - 8

D. 104

Answer: D

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A. $\frac{3\pi}{7}$

B.
$$\frac{2\pi}{7}$$

C. $-\frac{2\pi}{7}$
D. $-\frac{3\pi}{7}$

Answer: A

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9. If the eccentricity of the hyperbola
$$rac{x^2}{16}-rac{y^2}{b^2}=\,-1$$
 is $rac{5}{4}$, then b^2 is equal to



 $\mathsf{B.}\,\frac{16}{3}$

C. 9

D. 3

Answer: A

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10. The number of solutions of the equation $an x \sin x - 1 = an x - \sin x, \ orall \in [0, 2\pi]$ is euqal to

A. 1

B. 2

C. 3

D. 4

Answer: B

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11.

For

 $f{:}R o R, f(x) = x^4 - 8x^3 + 22x^2 - 24x$,

the sum of all local extreme value of f(x) is

equal to

 $\mathsf{A.}-9$

B.-8

- C. 17
- D. 6

Answer: D



$$f(n)=\Sigma_{r=1}^{10n}(6+rd) ext{ and } g(n)=\Sigma_{r=1}^n(6+rd)$$
 , where $n\in N, d
eq 0.$ If $rac{f(n)}{g(n)}$ is independent

of n, then d is equal to

A. 12

B.-6

C. 6

 $\mathsf{D.}-12$

Answer: D



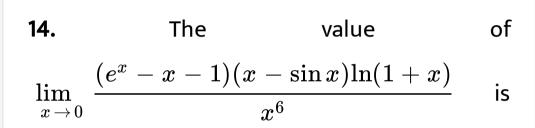
13. The tangent to the parabola $y=x^2-2x+8$ at P(2,8) touches the circle $x^2+y^2+18x+14y+\lambda=0$ at Q. The coordinates of point Q are

A.
$$(-7, -12)$$

B. $(-9, -13)$
C. $(-11, -16)$
D. $\left(-\frac{31}{5}, -\frac{42}{5}\right)$

Answer: D





equal to

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

B. $\frac{1}{6}$
C. $\frac{1}{12}$
D. $\frac{1}{3}$

Answer: C



15. The equation of an ex - circle of a triangle formed by the common tangents to the circle $x^{2} + y^{2} = 4$ and $x^{2} + y^{2} - 6x + 8 = 0$ is A. $x^2 + y^2 = 4$ B. $x^2 + y^2 - 6x + 8 = 0$ C. $x^2 + y^2 - 6x + 9 = 0$ D. $x^2 + y^2 = 1$

Answer: A



16. If the observation 1, 2, 3,, n occur with frequency, $n, (n-1), (n-2), \ldots, 1$ respectively such that the mean of observations is $\frac{13}{3}$, then n is equal to

A. 10

B. 11

D. 13

Answer: B

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17. The direction cosines of two lines satisfy 2l + 2m - n = 0 and lm + mn + nl = 0. The angle between these lines is

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

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

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

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

Answer: B

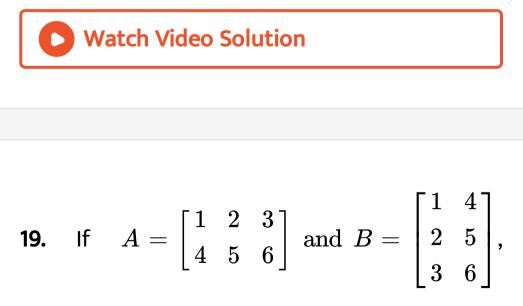


18. A statue of height 4 m stands on a tower of height 10 m. The angle subtended by the status at the eyes of an observer of height 2m, standing at a distance of 6m from base of the tower is

A.
$$\tan^{-1}\left(\frac{2}{11}\right)$$

B. $\tan^{-1}\left(\frac{4}{3}\right)$
C. $\tan^{-1}(2)$
D. $\tan^{-1}\left(\frac{7}{13}\right)$

Answer: A



then the determinant value of BA is

A. 8

B. 0

C. - 8

D. 24

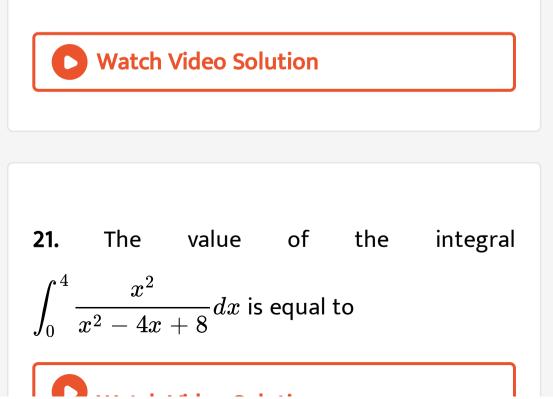
Answer: B

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20. The area bounded by the curve $y = \cos x$ and $y = \sin 2x, \ \forall x \in \left[\frac{\pi}{6}, \frac{\pi}{2}\right]$ is equal to

A.
$$\frac{\pi}{2}$$
 sq. units
B. $\frac{\pi}{3}$ sq. units
C. $7/4$ -(3)^(1/2)"sq. units"
D. $\frac{1}{4}$ sq. units

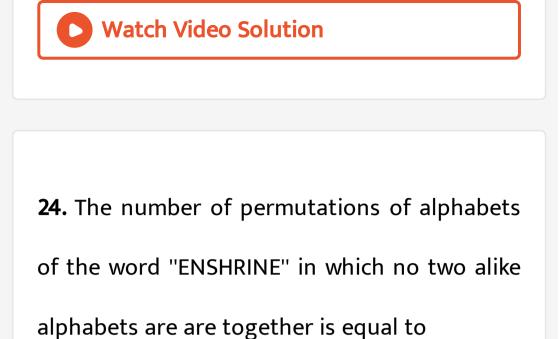
Answer: D





22. Let
$$\int \frac{x^3 + x^2 + x}{\sqrt{12x^3 + 15x^2 + 20x}} dx = f(x)$$
where $f(1) = \frac{\sqrt{47}}{30}$. If $(f(2))^2$ is equal to $\frac{p}{255}$, then the value of p is equal to Video Solution Watch Video Solution

23. Let
$$A = \begin{bmatrix} 1 & 1 \\ 3 & 3 \end{bmatrix}$$
 and $B = A + A^2 + A^3 + A^4.$
If $B = \lambda A, \ orall \lambda \in R$, then the value of λ is equal to



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25. For three vectors
$$\overrightarrow{a}, \overrightarrow{b}$$
 and \overrightarrow{c} , If $\left|\overrightarrow{a}\right| = 2, \left|\overrightarrow{b}\right| = 1, \overrightarrow{a} \times \overrightarrow{b} = \overrightarrow{c}$ and

