



## MATHS

### BOOKS - NTA MOCK TESTS

#### NTA JEE MOCK TEST 35

#### Mathematics

1. If  $f(x) = |2 \sin x - 1| - 2 \cot x$ , then the value of  $f'\left(\frac{\pi}{3}\right)$  is equal to

A. 0

B.  $-\frac{5}{3}$

C.  $\frac{5}{3}$

D.  $\frac{8}{3}$

Answer: C



Watch Video Solution

2. Let  $p$ : Maths is interesting and  $q$ : Maths is easy, then  $p \Rightarrow (\sim p \vee q)$  is equivalent to

- A. It Maths is easy then it is interesting
- B. Either Maths is interesting or it easy
- C. If Maths is interesting then it is easy
- D. Maths is neither interesting nor easy

Answer: C

 Watch Video Solution

3. If  $f(x) = \frac{x^2 - [x^2]}{1 + x^2 - [x^2]}$  (where  $[.]$  represents the greatest integer part of  $x$ ), then the range of  $f(x)$  is

- A.  $[0, 1)$

B.  $(-1, 1)$

C.  $(0, \infty)$

D.  $\left[0, \frac{1}{2}\right)$

**Answer: D**



**Watch Video Solution**

4. The area bounded by the curve  $y = \sin^{-1}(\sin x)$  and the x - axis from  $x = 0$  to  $x = 4\pi$  is equal to the area bounded by the curve  $y = \cos^{-1}(\cos x)$  and the x - axis from  $x = -\pi$  to  $x = a$ , then the value of a is equal to

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

B.  $2\pi$

C.  $\pi$

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

**Answer: C**



**Watch Video Solution**

5. If both the roots of the equation  $x^2 + (a - 1)x + a = 0$  are positive, the the complete solution set of real values of a is

A.  $(0, \infty)$

B.  $(0, 1)$

C.  $(0, 3 - 2\sqrt{2})$

D.  $(3 - 2\sqrt{2}, 1)$

**Answer: C**



**Watch Video Solution**

6. If  $f(x) = \min \left\{ \left( \sqrt{9 - x^2}, \sqrt{1 + x^2} \right) \right\}, \forall, x \in [-3, 3]$

then the number of point(s) where  $f(x)$  is non - differentiable is/are

A. 4

B. 3

C. 2

D. 0

**Answer: A**



**Watch Video Solution**

7. Let  $f(x) = \sin^{-1}\left\{x\sqrt{1-x} - \sqrt{x(1-x^2)}\right\}$ ,  $\forall 0 \leq x \leq 1$

then  $f(x)$  is

A. negative

B. positive

C. non - negative

D. non - positive

**Answer: D**

 [Watch Video Solution](#)

8. Let  $\vec{q}$  and  $\vec{r}$  be non - collinear vectors, If  $\vec{p}$  is a vector such that  $\vec{p} \cdot (\vec{q} + \vec{r}) = 4$  and  $\vec{p} \times (\vec{q} \times \vec{r}) = (x^2 - 2x + 9)\vec{q}$  then  $(x, y)$  lies on the line

A.  $x + y = 0$

B.  $x - y = 0$

C.  $x = 1$

D.  $y = \pi$

**Answer: C**

 [Watch Video Solution](#)

9. If  $z_1, z_2$  and  $z_3$  are 3 distinct complex numbers such that

$$\frac{3}{|z_1 - z_2|} = \frac{5}{|z_2 - z_3|} = \frac{7}{|z_3 - z_1|},$$
 then the value of  $\frac{9}{z_1 - z_2} + \frac{25}{z_2 - z_3} + \frac{49}{z_3 - z_1}$  is equal to

A. 0

B. 1

C.  $-1$

D. 15

**Answer: A**



**Watch Video Solution**

**10.** An ellipse has foci  $(4, 2)$ ,  $(2, 2)$  and it passes through the point  $P(2, 4)$ .

The eccentricity of the ellipse is

A.  $\tan. \frac{\pi}{10}$

B.  $\tan. \frac{\pi}{12}$

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

D.  $\tan. \frac{\pi}{8}$

**Answer: D**



Watch Video Solution

11. If the integral  $\int \frac{x^4 + x^2 + 1}{x^2x - x + 1} dx = f(x) + C$ , (where  $C$  is the constant of integration and  $x \in R$ ), then the minimum value of  $f'(x)$  is

A. 1

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

C.  $\frac{3}{4}$

D. 2

Answer: C



Watch Video Solution

12. The value of  $\lim_{n \rightarrow \infty} \sum_{r=1}^n \frac{2^r + 3^r}{6^r}$  is equal to

A. 0

B. 1



C. 6

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

**Answer: D**



[Watch Video Solution](#)

13. The coefficient of  $x^4$  in the expansion of  $(1 - x - 2x^2)^8$  is

A. 144

B.  $-144$

C. 154

D.  $-154$

**Answer: D**



[Watch Video Solution](#)

14. The number of roots of the equation  $\tan x + \sec x = 2 \cos x$  in  $[0, 4\pi]$  is

- A. 2
- B. 4
- C. 6
- D. 0

**Answer: B**



[Watch Video Solution](#)

15. If  $a = \int_0^1 \frac{\cos(\sin x)}{\sec x} dx$ , then the value of  $a^2 \cos^2(\sin 1)$  is equal to

- A. 0
- B. 1
- C.  $\sin(1)$

D.  $\sin(\sin 1)$

**Answer: B**



[Watch Video Solution](#)

16. If the largest interval of  $x$  in which the function  $f(x) = x^3 - 3x + 1$  is decreasing is  $(a, b)$ , then the value of  $a + 2b$  is equal to

A.  $-1$

B.  $0$

C.  $1$

D.  $2$

**Answer: C**



[Watch Video Solution](#)

17.

Let

$$P_1 = x + y + z + 1 = 0, P_2 = x - y + 2z + 1 = 0, P_3 = 3x + y + 4z + 7 = 0$$

be three planes. Find the distance of line of intersection of planes  $P_1 = 0$

and  $P_2 = 0$  from the plane  $P_3 = 0$ .

A.  $\frac{2}{\sqrt{26}}$  units

B.  $\frac{1}{\sqrt{26}}$  units

C.  $\frac{4}{\sqrt{26}}$  units

D.  $\frac{7}{\sqrt{26}}$  units

**Answer: C**



**Watch Video Solution**

18. If  $x_1, x_2, x_3, \dots, x_{34}$  are numbers such that

$$x_i = x_{i+1} = 150, \forall I \in \{1, 2, 3, 4, \dots, 9\} \quad \text{and}$$

$$x_{i+1} - x_i = -2, \forall I \in \{10, 11, \dots, 33\}, \quad \text{then median of}$$

$x_1, x_2, x_3, \dots, x_{34}$  is

A. 134

B. 135

C. 148

D. 150

**Answer: B**



**Watch Video Solution**

**19.** Let  $(x_1, y_1)$ ,  $(x_2, y_2)$ ,  $(x_3, y_3)$  and  $(x_4, y_4)$  are four points which are at unit distance from the lines  $3x - 4y + 1 = 0$  and  $8x + 6y + 1 = 0$ , then the value of  $\frac{\sum_{i=1}^4 x_i}{\sum_{i=1}^4 y_i}$  is equal to

A. 2

B. -2

C. 1

D. -1

**Answer: B**



**Watch Video Solution**

20. Let  $P_n$  be a square matrix of order 3 such that  $P_n = [a_{ij}]$ , where  $a_{ij} = \frac{3i + j}{4^n}$  for  $1 \leq i \leq 3, 1 \leq j \leq 3$ . Then the value of  $\lim_{n \rightarrow \infty} T_r(4P_1 + 4^2P_2 + \dots + 4^n P_n)$  is (where  $T_r(A)$  denotes trace of matrix A i.e. sum of principle diagonal elements of A)

A. 7

B. 8

C.  $\frac{25}{3}$

D. 9

**Answer: B**



**Watch Video Solution**

21. If the length of direct common tangent and transverse common tangent of two circles with integral radii are 3 units and 1 unit respectively, then the reciprocal of the square of the distance between the centres of the circles is equal to

 [Watch Video Solution](#)

22. Let  $y = f(x)$  satisfies  $\frac{dy}{dx} = \frac{x+y}{x}$  and  $f(e) = e$  then the value of  $f(1)$  is

 [Watch Video Solution](#)

23. Let  $A = \begin{bmatrix} 1/2 & 3/4 \\ 1 & -1/2 \end{bmatrix}$ , then the value of sum of all the elements of  $A^{100}$  is

 [Watch Video Solution](#)

24. Let  $lx - 2y = 1$  intersects the parabola  $y^2 = 4ax$  at points P and Q. If PS and QS meet the parabola again at R and T respectively (where S is the focus of  $y^2 = 4ax$ ) then the slope of RT is equal to



[Watch Video Solution](#)

25. If 2 distinct numbers are between 0 to 180 (both inclusive) and the probability that their average is 60 is k, then  $1086k$  is equal to



[Watch Video Solution](#)