

MHT CET 2026 Mathematics Memory Based Question Paper PDF

Mathematics

1. If $y = y(x)$ satisfies the differential equation

$$\left(\frac{2 + \sin x}{1 + y} \right) \frac{dy}{dx} = -\cos x$$

and $y(0) = 2$, then $y\left(\frac{\pi}{2}\right)$ is equal to:

- (1) 3
 - (2) 4
 - (3) 2
 - (4) 1
2. The ratio of areas bounded by the curves

$$y = \cos x$$

and

$$y = \cos 2x$$

between $x = 0$, $x = \frac{\pi}{3}$ and the x -axis is:

- (A) 2 : 1
- (B) 1 : 2
- (C) 1 : 1
- (D) 1 : 3

3. If

$$(2 + \sin x) \frac{dy}{dx} + (y + 1) \cos x = 0$$

and $y(0) = 1$, then find the value of $y\left(\frac{\pi}{2}\right)$.

- (A) $-\frac{2}{3}$
- (B) $-\frac{1}{3}$
- (C) $\frac{4}{3}$
- (D) $\frac{1}{3}$

4. If

$$\left(\frac{2 + \sin x}{1 + y} \right) \frac{dy}{dx} = -\cos x$$

and $y(0) = 2$, then find the value of $y\left(\frac{\pi}{2}\right)$.

- (1) 3
- (2) 4
- (3) 2

(4) 1

5. If

$$(2 + \sin x) \frac{dy}{dx} + (y + 1) \cos x = 0$$

and $y(0) = 1$, then $y\left(\frac{\pi}{2}\right)$ is equal to:

(1) $-\frac{2}{3}$

(2) $-\frac{1}{3}$

(3) $\frac{4}{3}$

(4) $\frac{1}{3}$

6. Solve for x :

$$x + \log_{15}(5 + 3^x) = x \log_{15} 5 + \log_{15} 24$$

(1) 2

(2) 1

(3) 5

(4) 8

7. For $n \in \mathbb{N}$, if

$$y = ax^{n+1} + bx^{-n}$$

then

$$x^2 \frac{d^2 y}{dx^2}$$

is equal to:

(1) $(n-1)y$

(2) $n(n-1)y$

(3) $n(n+1)y$

(4) $(n+1)y$

8. Solve for x :

$$x + \log_{15}(5 + 3^x) = x \log_{15} 5 + \log_{15} 24$$

(A) 2

(B) 1

(C) 5

(D) 8

9. For $n \in \mathbb{N}$, if

$$y = ax^{n+1} + bx^{-n}$$

then

$$x^2 \frac{d^2 y}{dx^2}$$

is equal to:

(1) $(n-1)y$

(2) $n(n-1)y$

(3) $n(n+1)y$

(4) $(n+1)y$

10. Let

$$f(x) = \int_1^4 \log[x] dx$$

where $[x]$ denotes the greatest integer function. Then the value of $f(x)$ is:

- (A) $\log 2$
- (B) $\log 3$
- (C) $\log 5$
- (D) $\log 6$

prepp
Your Personal Exam Guide