

MHT CET 2026 Mathematics Answer Key PDF

Mathematics

1. Option (4) 1

Explanation:

Separating variables in the given differential equation leads to $\frac{dy}{1+y} = -\frac{\cos x}{2+\sin x} dx$. Integrating both sides and substituting the boundary condition $y(0) = 2$ yields the relation $(1+y)(2+\sin x) = 6$, which gives $y(\pi/2) = 1$.

2. Option (A) 2 : 1

Explanation:

Integrating both functions over the interval $[0, \pi/3]$ gives the respective areas as $A_1 = \int_0^{\pi/3} \cos x dx = \frac{\sqrt{3}}{2}$ and $A_2 = \int_0^{\pi/3} \cos 2x dx = \frac{\sqrt{3}}{4}$. The ratio of these calculated areas is $A_1 : A_2 = 2 : 1$.

3. Option (D) 1/3

Explanation:

Separating the variables yields $\frac{dy}{y+1} = -\frac{\cos x}{2+\sin x} dx$, which integrates directly to $(y+1)(2+\sin x) = K$. Applying the initial value $y(0) = 1$ gives $K = 4$, and evaluating this at $x = \pi/2$ results in $y = 1/3$.

4. Option (4) 1

Explanation:

Separating variables in the given differential equation leads to $\frac{dy}{1+y} = -\frac{\cos x}{2+\sin x} dx$. Integrating both sides and substituting the boundary condition $y(0) = 2$ yields the relation $(1+y)(2+\sin x) = 6$, which gives $y(\pi/2) = 1$.

5. Option (4) 1/3

Explanation:

Separating the variables yields $\frac{dy}{y+1} = -\frac{\cos x}{2+\sin x} dx$, which integrates directly to $(y+1)(2+\sin x) = K$. Applying the initial value $y(0) = 1$ gives $K = 4$, and evaluating this at $x = \pi/2$ results in $y = 1/3$.

6. Option (2) 1

Explanation:

Expressing x as $\log_{15}(15^x)$ simplifies the logarithmic equation to $\log_{15}(15^x(5+3^x)) = \log_{15}(24 \cdot 5^x)$. Cancelling 5^x from both sides leaves $3^x(5+3^x) = 24$, which simplifies to $3^x = 3 \implies x = 1$.

7. Option (3) $n(n+1)y$

Explanation:

Differentiating y twice with respect to x yields $y'' = an(n+1)x^{n-1} + bn(n+1)x^{n-2}$. Multiplying the second derivative by x^2 allows $n(n+1)$ to be factored out, leaving $x^2 y'' = n(n+1)y$.

8. Option (B) 1

Explanation:

Expressing x as $\log_{15}(15^x)$ simplifies the logarithmic equation to $\log_{15}(15^x(5+3^x)) = \log_{15}(24 \cdot 5^x)$. Cancelling 5^x from both sides leaves $3^x(5+3^x) = 24$, which simplifies to $3^x = 3 \implies x = 1$.

9. Option (3) $n(n+1)y$

Explanation:

Differentiating y twice with respect to x yields $y'' = an(n+1)x^{n-1} + bn(n+1)x^{-n-2}$. Multiplying the second derivative by x^2 allows $n(n+1)$ to be factored out, leaving $x^2y'' = n(n+1)y$.

10. **Option (D)** $\log 6$

Explanation:

Splitting the integral based on the intervals of the greatest integer function $[x]$ gives $\int_1^2 \log(1)dx + \int_2^3 \log(2)dx + \int_3^4 \log(3)dx$. This evaluates directly to $0 + \log 2 + \log 3 = \log 6$.

