

JEE MAIN APPLICATION OF DERIVATIVES — ABSOLUTE MAXIMA AND MINIMA ON A CLOSED INTERVAL — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 4 questions

Q.1 Let $A = \begin{bmatrix} 1 & 3 & -1 \\ 2 & 1 & \alpha \\ 0 & 1 & -1 \end{bmatrix}$ be a singular matrix. Let

$f(x) = \int_0^x (t^2 + 2t + 3) dt$, $x \in [1, \alpha]$. If M and m are respectively the maximum and the minimum values of f in $[1, \alpha]$, then $3(M - m)$ is equal to :

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) 64 (2) 68 (3) 72 (4) 76

Scan or tap for the full solution



Q.2 $\max_{0 \leq x \leq \pi} \left(16 \sin \left(\frac{x}{2} \right) \cos^3 \left(\frac{x}{2} \right) \right)$ is equal to :

[JEE Main 2026 (Online) 4th April Evening Shift]

- (1) $\frac{3\sqrt{3}}{2}$ (2) $3\sqrt{3}$ (3) $4\sqrt{3}$ (4) $6\sqrt{3}$

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Q.3 Let $f(x) = x^{2025} - x^{2000}$, $x \in [0, 1]$ and the minimum value of the function $f(x)$ in the interval $[0, 1]$ be $(80)^{80}(n)^{-81}$. Then n is equal to

[JEE Main 2026 (Online) 22nd January Morning Shift]

- (1) -40 (2) -41 (3) -80 (4) -81

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Q.4 Let $x = -1$ and $x = 2$ be the critical points of the function $f(x) = x^3 + ax^2 + b \log_e |x| + 1$, $x \neq 0$. Let m and M respectively be the absolute minimum and the absolute maximum values of f in the interval $\left[-2, -\frac{1}{2}\right]$. Then $|M + m|$ is equal to (Take $\log_e 2 = 0.7$):

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 21.1 (2) 19.8 (3) 22.1 (4) 20.9

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ANSWER KEY

Ques.	1	2	3	4							
Ans.	2	2	4	1							