

JEE MAIN LIMITS AND DERIVATIVES — LIMITS OF EXPONENTIAL AND LOGARITHMIC FUNCTIONS — PYQS

Max. Marks: 12
Questions: 3

Section A (MCQ) — 2 questions

Q.1 If $\lim_{x \rightarrow 2} \frac{\sin(x^3 - 5x^2 + ax + b)}{(\sqrt{x-1} - 1)\log_e(x-1)} = m$, then $a + b + m$ is equal to :

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 5 (2) 6 (3) 8 (4) 10

Scan or tap for the full solution



Q.2 Let f be a differentiable function on $\mathbb{R}$ such that $f(2) = 1$, $f'(2) = 4$. Let $\lim_{x \rightarrow 0} (f(2+x))^{3/x} = e^\alpha$. Then the number of times the curve $y = 4x^3 - 4x^2 - 4(\alpha - 7)x - \alpha$ meets x -axis is :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) 3 (2) 1 (3) 2 (4) 0

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Section B (Numerical) — 1 question

Q.3 Let $f(x) = \lim_{n \rightarrow \infty} \sum_{r=0}^n \left(\frac{\tan(x/2^{r+1}) + \tan^3(x/2^{r+1})}{1 - \tan^2(x/2^{r+1})} \right)$. Then $\lim_{x \rightarrow 0} \frac{e^x - e^{f(x)}}{(x - f(x))}$ is equal to _____.

[JEE Main 2025 (Online) 28th January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 2 questions

Ques.	1	2																		
Ans.	2	3																		

Section B (Numerical) — 1 question

Ques.	3																			
Ans.	1																			