

JEE MAIN LIMITS AND DERIVATIVES — LIMITS OF TRIGONOMETRIC FUNCTIONS — PYQS

Max. Marks: 16
Questions: 4

Section A (MCQ) — 4 questions

- Q.1** Let $\lim_{x \rightarrow 2} \frac{(\tan(x-2))(rx^2 + (p-2)x - 2p)}{(x-2)^2} = 5$ for some $r, p \in \mathbb{R}$. If the set of all possible values of q , such that the roots of the equation $rx^2 - px + q = 0$ lie in $(0, 2)$, be the interval $(\alpha, \beta]$, then $4(\alpha + \beta)$ equals : [JEE Main 2026 (Online) 6th April Evening Shift]
- (1) 11 (2) 13 (3) 17 (4) 21

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- Q.2** The product of all possible values of α , for which $\lim_{x \rightarrow 0} \left(\frac{1 - \cos(\alpha x) \cos((\alpha+1)x) \cos((\alpha+2)x)}{\sin^2((\alpha+1)x)} \right) = 2$, is : [JEE Main 2026 (Online) 5th April Morning Shift]
- (1) -2 (2) 1 (3) -1 (4) $\frac{5}{4}$

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- Q.3** Let $f(x) = \lim_{y \rightarrow 0} \frac{(1 - \cos(xy)) \tan(xy)}{y^3}$. Then the number of solutions of the equation $f(x) = \sin x$, $x \in \mathbb{R}$ is :

[JEE Main 2026 (Online) 5th April Evening Shift]

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

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- Q.4** $\lim_{x \rightarrow 0^+} \frac{\tan\left(5(x)^{\frac{1}{3}}\right) \log_e(1+3x^2)}{\left(\tan^{-1} 3\sqrt{x}\right)^2 \left(e^{5(x)^{\frac{4}{3}}} - 1\right)}$ is equal to

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

- (1) $\frac{5}{3}$ (2) 1 (3) $\frac{1}{3}$ (4) $\frac{1}{15}$

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ANSWER KEY

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