

Math 101 Section 29 & 37 Test III (Term 141)

Name : Id #..... List no:

1. **The Mean Value Theorem:** $f(x) = \ln x$, $[e, 2e]$.

2. Find the absolute maximum and the absolute minimum values: $f(x) = x - \ln x$, $[e^{-1}, e^2]$.

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3. Sketch the graph and **give the details:** $f(x) = x e^{-x}$.

4. **Find the limit:**

(a) $\lim_{x \rightarrow \infty} x \tan\left(\frac{1}{x}\right)$.

(b) $\lim_{x \rightarrow 0^+} (1 + \sin 2x)^{\cot x}$.