

Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals

TRENT UNIVERSITY, Fall 2025

Workshop Problems for 2025-10-17

These are the sort of problems most likely to turn up on Test #3 ...

- Find the absolute maximum and minimum, if any, of $f(x) = \frac{x^2 - 1}{x^2 + 1}$ on the interval $[-2, 2]$.
- Find the absolute maximum and minimum, if any, of $g(x) = x \ln(x)$ on the interval $(0, e)$.
- Find the domain, any and all intercepts, horizontal and vertical asymptotes, intervals of increase and decrease, maxima & minima, intervals of concavity, and inflection points of $y = x + \ln(x)$.
- Find the domain, any and all intercepts, horizontal and vertical asymptotes, intervals of increase and decrease, maxima & minima, intervals of concavity, and inflection points of $y = xe^{-x}$.
- Find the domain, any and all intercepts, horizontal and vertical asymptotes, intervals of increase and decrease, maxima & minima, intervals of concavity, and inflection points of $y = \arctan(x)$.
- Find any and all intercepts, horizontal and vertical asymptotes, intervals of increase and decrease, maxima & minima, intervals of concavity, and inflection points of $y = x \tan\left(x - \frac{\pi}{2}\right)$, where $0 < x < \frac{\pi}{2}$.