

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

TRENT UNIVERSITY, Summer 2025 (S62)

Quiz #2 – Derivatives

Due on Tuesday, 24 June.

*

1. Let $f(x) = x \ln(x^2)$. Compute $f'(x)$ by hand using the practical rules for computing derivatives and knowledge of the derivatives of common functions. Show all the steps! [1.5]
2. Let $g(x) = \frac{\cos(e^x)}{e^x}$. Compute $g'(x)$ by hand using the practical rules for computing derivatives and knowledge of the derivatives of common functions. Show all the steps! [1.5]
3. Given that we know that $\frac{d}{dx} \sin(x) = \cos(x)$ for all x and that $\sin(0) = 0$ and $\cos(0) = 1$, what does this tell us about what the value of $\lim_{h \rightarrow 0} \frac{\sin(h)}{h}$ has to be? Explain! [2]

Hint: Look at the definition of $\frac{d}{dx} \sin(x)$ when $x = 0$.

Some Error Message Haiku

... from a Salon magazine contest.

Three things are certain:
Death, taxes, and lost data.
Guess which has occurred.

The code was willing,
It considered your request,
But the chips were weak.

Serious error.
All shortcuts have disappeared
Screen. Mind. Both are blank.

Chaos reigns within.
Reflect, repent, and reboot.
Order shall return.

* You should submit your solutions via Blackboard's Assignments module, preferably as a single pdf. If submission via Blackboard fails, please submit your work to your instructor by email or on paper. You may work together and look things up, so long as you write up your submission by yourself and give due credit to your collaborators and any sources you actually used.