Mathematics 122

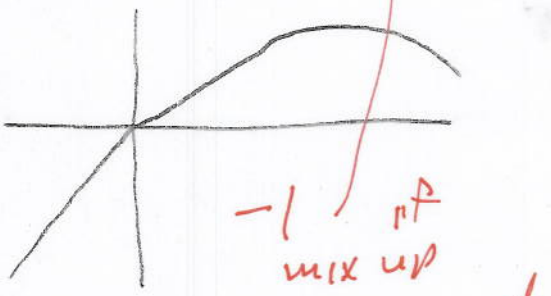
Quiz #23 Name: Key

You must show your work to get full credit.

(1) Find the maximum, minimum, maximizer, and minimizer of

$$f(x) = \frac{x}{2^x + 2} \quad \text{for} \quad -1 \le x \le 3.$$

Put
$Y_1 = X/(2^X + 2)$
$X_{min} = -1$
$X_{max} = 3$
and use ZoomFit to get a graph that looks like



1 pt maximum 0.3340235

1 pt maximizer 2.1107435

1 pt minimum −.4

1 pt minimizer −1

This makes it clear that minimizer is $x = -1$. Use 2nd calc value to get minimum $= -.4$.
Use 2'calc value maximum to find the maximum and maximizer.

−1 1 pt
mix up maximum and ~~minimum~~ maximizer
Likewise for minimum and minimizer.

(2) Find the derivative of $f(x) = x^3 \ln(x)$. $f'(x) =$ $3x^2 \ln(x) + x^2$

$f'(x) = (x^3)' \ln(x) + x^3 (\ln(x))'$ 1 pt

$= 3x^2 \ln(x) + x^3 \frac{1}{x}$ ← OK now.

$= 3x^2 \ln(x) + x^2$