Quiz 4, Math 115-11, Calculus I

Feb 14, 2007

Name:_____

Extinguish all cell phones, pagers, beepers, etc. No headphones allowed. Calculators *are* allowed. Show appropriate work and provide units where appropriate.

1. Find the fifth derivative of $x^5 + 20x^4 - 17x^3 + 139x^2 + 46x + 2$. (Think before you start!)

2. Find the first and second derivatives of $\frac{x}{e^{-x}}$.

3. Find the derivative of $(1 + x^2)^{100}$.

4. (Optional bonus question. This will not count; do the others first. The absolute value function is found on the calculator by hitting [2ND] [CATALOG], scrolling down to [abs(]—it's right on top on my calculator—and hitting enter. Also note that $|x|$ is equal to x when $x \geq 0$ and to $-x$ when $x \leq 0$.)

   Let $f(x) = (|x| - 2)^3 - 4(|x| - 2)$. Find the *second* derivative $f''(x)$ and plot f and f'' on the same graph, in the window $-2 \leq x \leq 2$, $-12 \leq y \leq 4$.