

Serial No.: _____ Student Name: _____ Student Number: _____
Instructor: M. Z. Abu-Sbeih Math 101- Q5 Date: 18-8-2008

Problem 1: (4 points) Find the linearization of $f(x) = \sqrt{x} + \ln x$ at $a = 1$, and use it to approximate $\sqrt{1.1} + \ln 1.1$

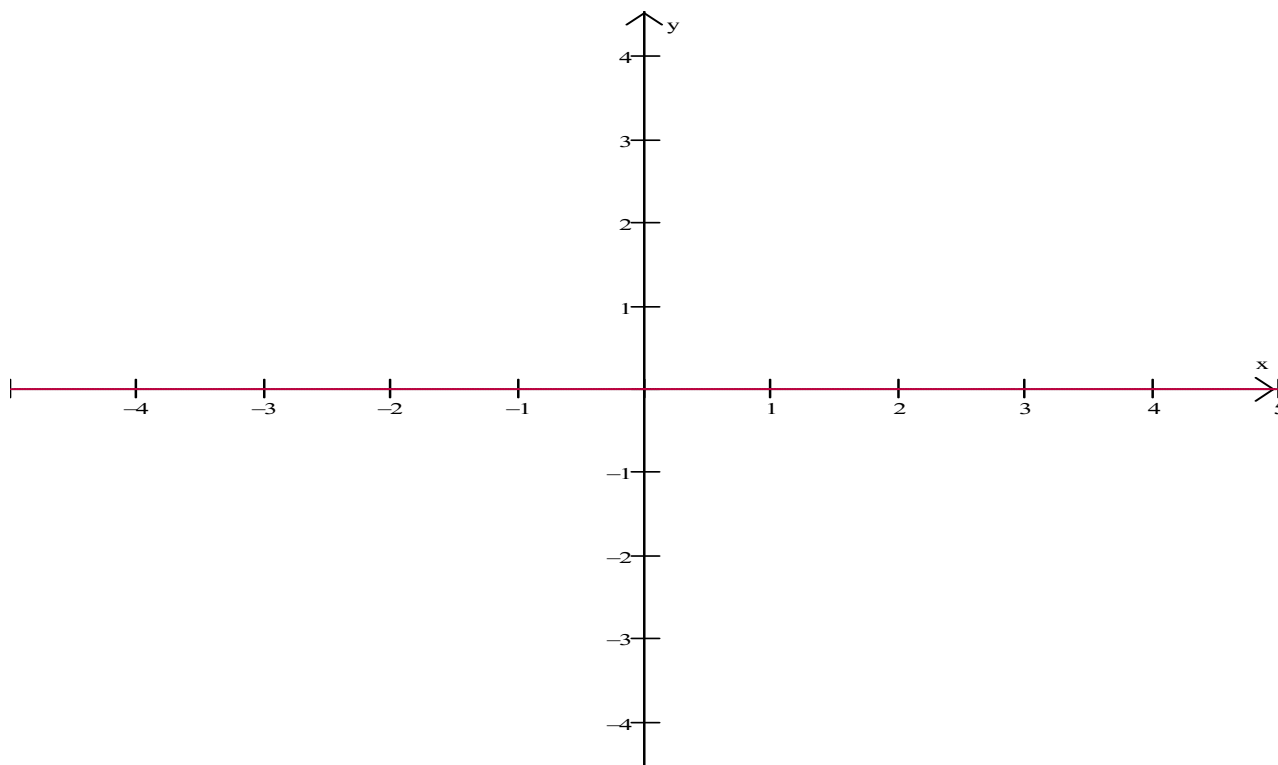
Problem 2: (4 points) Use differentials to approximate $\ln \sqrt{1.1}$

Problem 3: (4 points) Find the absolute extrema of the function $y = x^{\frac{1}{3}}(2-x)$ on the interval $[0,2]$.

Problem 4: (4 points) If $f(1) = 10$ and $f'(x) \geq 2$ for all x , how small can $f(4)$ possibly be.

Problem 5: (12 points) Consider the function $f(x) = x e^{-x}$.

1. Find increasing and decreasing intervals
2. Find local extrema.
3. Find concavity intervals.
4. Find inflection points.
5. Sketch the graph (mark all important points on the graph).



6. Find absolute extrema.