

King Fahd University of Petroleum and Minerals

Department of Mathematical Sciences

Math 132 Exam #: 2

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May 4, 2005

6:30 - 7:45 PM

Serial #:

Student #:

Name:

SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERS NOT SUPPORTED BY WORK.

1. (30 points) Consider the function $f(x) = x^3 - 3x$.
 - a) Find the critical numbers if any exists.
 - b) Find the increasing and decreasing intervals.
 - c) Find the local and absolute extrema if any exists.
 - d) Find the concavity intervals.
 - e) Find the inflection points if any exists.
 - f) Sketch the graph of the function **Clearly indicate all important points on the graph**; such as, extrema, inflection points, and intercepts if any such points exist. Also the concavity must be clear.
2. (10 points) The demand equation for a certain product is $p = 40 - 2q$. The average cost of q units is $\bar{C}(q) = q + 4 + \frac{500}{q}$. Find q which will maximize the profit P .
3. (10 points) Use differentials to estimate approximate $e^{-0.01}$.
4. (10 points) Find The area between the graphs of $f(x) = x^3 + 1$ and $f(x) = x + 1$.
5. (10 points) Find the derivative of $y = (2x)^{3x}$.
6. (30 points) Integrate each of the following (DO ONLY 3 PROBLEMS):
 - a) $\int_0^1 \sqrt{x+1} (x+1) dx$
 - b) $\int \frac{x dx}{2x^2 + 3}$
 - c) $\int \frac{\ln x}{x} dx$
 - d) $\int e^x 2^{1-x} dx$