MiniTest 4A - MTH 1310

Dr. Graham-Squire, Fall 2012

Name: _____

I pledge that I have neither given nor received any unauthorized assistance on this exam.

_____

(*signature*)

DIRECTIONS

1. Show all of your work and use correct notation. A correct answer with insufficient work or incorrect notation will lose points.
2. Clearly indicate your answer by putting a box around it.
3. Cell phones and computers are <u>not</u> allowed on this test. All cell phones should be turned off and put away, if I see a cell phone out it will be considered an honor code violation.
4. Calculators <u>are</u> allowed on the first 2 questions of the test, however you should still show all of your work. No calculators are allowed on the last 3 questions.
5. Give all answers in exact form, not decimal form (that is, put π instead of 3.1415, $\sqrt{2}$ instead of 1.414, etc) unless otherwise stated.
6. If you need to use the quadratic formula, it is $\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
7. Make sure you sign the pledge.
8. Number of questions = 5. Total Points = 40.

1. (7 points) Lemur populations in captivity are known to follow an exponential growth model. Suppose a zoo starts with 80 lemurs, and it is known that the population will double after 3 years. How many years will it be until they have 300 lemurs? Round your answer to the nearest 0.01 years.

2. (5 points) Use logarithmic differentiation to find the $\frac{dy}{dx}$ (or y') for

$$y = (x+3)^{3x}$$

NO CALCULATORS FOR THIS PART

3. (8 points) Find the indefinite integrals:

(a) $\int \left(4e^x - \frac{7}{x}\right) dx$

(b) $\int \frac{1+x}{\sqrt{x}}\, dx$

4. (12 points) Calculate the derivative of each function. Simplify your answer if possible.

(a) $f(x) = \left(e^{(x^4-2x)}\right)^3$

(b) $f(x) = \ln(x^4 \cdot e^{x^5})$

5. (8 points) Calculate the integral. Make sure to show your work!

$$\int \frac{4x^3 \cdot \ln(x^4+5)}{x^4+5}\,dx$$

Extra Credit (1 point) Calculate the antiderivative: $\int e^{\ln e^3}\,dt$.