MATH 211 (LECTURE 1)

EXAM 2

Student name:

Student ID:

Discussion instructor name:

Circle discussion section you are enrolled in:

301 302 303 304 305 306 307 308 309 310 311

Grades:

1	2	3	4	5	6	7	total

Instructions:

This exam consists of 7 questions.

Show all work, in a clear, explicit and ordered fashion. Partial work may lead to partial credit; an answer (even correct) without work will receive no credit.

No books or notes allowed. No calculators allowed.

An extra page is provided at the end, if needed.

Date: February 27 2006.

(1) (15 pts) A bank account with a yearly interest rate of 12% is opened with an initial deposit of \$1000. Find the formula for the balance at the end of t years if the interest is compounded:

(a) Monthly (7 pts).

(b) Continuously (7 pts).

Which is larger (i.e., better for the investor) (1 pt)?

(2) (15 pts) A scientist puts a 1kg block of Kryptonite 264 in a safe. After ten years, only 25% of the Kryptonite is left. Find the decay constant and half-life time of Kryptonite 264.

(3) (15 pts) Simplify the following expressions into expressions involving only $\log_3 x$, $\log_3 y$ and numbers (3 pts each):

(a) $\log_3(x^3)$.

(b) $\log_3(3^x)$.

(c) $\log_3(xy)$.

(d) $\log_3 \frac{x}{y}$.

(e) $\log_3 \sqrt{3}$.

(4) (20 pts) Find the derivatives of the following functions:

(a) $y = e^{x^2+1}$.

(b) $y = x \ln x - x$.

(c) $y = \frac{x+1}{x^2}$.

(d) $y = \log_5(x^2 + 1)$.

(5) (10 pts) Find the equation of the tangent line to $y = x^3 - x$ at the point $(2, 6)$.

(6) (15 pts) Use linear approximation to estimate $\sqrt{10002}$. The solution should be either a fraction or a decimal number.

(7) (10 pts) A a particle moves along a straight line. Its position at time t is given by: $s(t) = t^2 - \sqrt[3]{t}$. What is its acceleration when $t = 1$?

Extra page