MATH 1300: CALCULUS 1
March 15, 2005
2nd MIDTERM TEST

YOUR NAME:

◯ **001** E. Mankin ....(8am)

◯ **002** N. Flores ....(9am)

◯ **003** R. Chestnut ....(9am)

◯ **004** E. Frugoni ....(10am)

◯ **005** J. Fuhrmann ....(11am)

◯ **006** J. Sanders ....(11am)

◯ **007** J. Nibert ....(12pm)

◯ **008** M. Walter ....(2pm)

◯ **009** T. Schumacher ....(2pm)

◯ **011** J. Wiscons ....(10am)

◯ **012** V. Wong ....(12pm)

◯ **013** S. Tramer ....(1pm)

◯ **014** C. Moody ....(1pm)

◯ **015** J. Johanson ....(3pm)

Show all your work.
Answers out of the blue and without any supporting work
will receive no credit *even if they are right!*

Write clearly.   **Box your final answers.**
No calculators allowed.   **No cheat sheets allowed.**

After you get the test back, if you consider that something was incorrectly graded,
DO NOT WRITE ON YOUR TEST!
As clearly as possible write down your version of the story on a clean sheet of paper,
attach it to your test, and give it back to your instructor for further consideration.

DO NOT WRITE ON THIS BOX!

problem	points	score
1	12 pts	
2	30 pts	
3	10 pts	
4	8 pts	
5	8 pts	
6	20 pts	
7	12 pts	
TOTAL	100 pts	

1: *(12 points)* The graphs of 6 functions are shown below (graphs A - F) together with the graphs of their derivatives (graphs 1 - 6). Match the graph of each function with the graph of its derivative.

A)_____

B)_____

C)_____

D)_____

E)_____

F)_____

2: *(30 points)* Find $\frac{dy}{dx}$

(a) $y = (3x^2 + 5x - 7)(11x^3 - 13x + 17)$

(b) $y = \cos(\ln x))$

(c) $y = \ln 2$

(d) $y = \cos^{-1}(e^x)$

(e) $xy^2 = yx - 1$

(f) $y = x^x$

3: *(10 points)* Let $y = 3x^2 + 2$. Find the derivative of y using:

(i) the limit definition of the derivative.

(ii) the power rule.

4: *(8 points)* Find all values of x at which the curve $y = \frac{x^2 + 20}{x + 4}$ has a horizontal tangent line.

5: *(8 points)* Find an equation for the tangent line to the graph of $y = \ln(\sin(x))$ at $x = \frac{\pi}{2}$

6: *(20 points)* Calculate the following limits:

(a) $\lim\limits_{\theta \to 0} \dfrac{\tan \theta}{\sin \theta}$

(b) $\lim\limits_{x \to 0} \dfrac{x^3 - 7x - 6}{x^3 - 3x^2 - x + 3}$

(c) $\lim\limits_{x \to 0} \left(\dfrac{1}{x^2} - \dfrac{\cos(2x)}{x^2} \right)$

(d) $\lim\limits_{x \to \infty} \dfrac{(2x)^{20}}{e^x}$

(e) $\lim\limits_{x \to 0^+} x^x$

7: *(12 points)* A block of ice in the shape of a cube is melting at a rate of $3 \ cm^3$ each minute. At what rate is the length of a side of the cube of ice changing when the volume is $64 \ cm^3$?