

Name: \_\_\_\_\_

**Test 2**  
Spring 2007  
MATH 122 Section 01  
March 5, 2007

**Directions :** You have 50 minutes to complete all 4 problems on this exam. There are a possible 100 points to be earned. You may not use your book or any graphing/programmable calculator. Please be sure to show all pertinent work. *An incorrect answer with no work will receive no credit!* If any portion of the exam is unclear please come to me and I will elaborate provided I can do so without giving away the problem.

1. (20 points)

Find the limit. Use l'Hospital's Rule where appropriate. If there is a more elementary method, consider using it. If l'Hospital's Rule doesn't apply, explain why.

(a)  $\lim_{t \rightarrow 0} \frac{e^t - 1}{t^3}$

(b)  $\lim_{x \rightarrow \infty} \frac{\ln(x)}{x}$

2. (10 points)

Use logarithmic differentiation to find the derivative of the function

$$y = x^{e^x}.$$

3. (20 points)  
Find the derivative.

(a)  $y = e^{\cosh(3x)}$

(b)  $H(x) = (1 + x^2) \arctan(x)$

4. (50 points)

Evaluate the integral.

(a)  $\int_1^2 \frac{dt}{8-3t}$

(b)  $\int \frac{x+9}{x^2+9} dx$

(c)  $\int \frac{\sinh(\sqrt{x})}{\sqrt{x}} dx$

(d)  $\int x \cos(5x) dx$

(e)  $\int \sec^2(x) \tan(x) dx$