Math 106-Sec 25X Fall '11 **Exam 3** **Score:** _____

Name: _____ **TA's Name:** _____

page	1	2	3	4	total
score					

Instructions: You must show supporting work as much as possible to receive full and partial credits. No text book, notes, formula sheets allowed.

1(16pts) Approximate the integral $\int_1^2 (x^2-1)dx$ by the following Riemann sums:

(a) The left-point sum R_4.

(b) The right-point sum L_4.

2(16pts) (a) Let $F(x) = \int_1^{2\sin x} \cos(t)dt$. Find $F'(0)$_____.

(b) If $\int_0^2 g(t)dt = 1$, $\int_0^1 g(x)dx = 2$, find $\int_1^2 g(s)ds$_____.

(*Continue on Next Page ...*)

3(20pts) Use the method of substitution to find the integrals. (Exact values for definite integrals.)

(a) $\int (\cos x + 1) e^{2(\sin x + x)} dx.$

(b) $\int_0^1 \frac{x}{\sqrt{x^2+1}} dx$

(*Continue on Next Page ...*)

4(16pts) A region is bounded by the curves $y = 2 - x^2$ and $y = x$. Sketch the region and set up an integral for its area. (**Do Not Evaluate The Integral.**)

(*Continue on Next Page ...*)

5(16pts) A region R is bounded by $y = \sin x$ and the x-axis over the interval $[0, \pi]$. Use the method of washer to set up an integral for the volume of the solid which is obtained by rotating the region R around the x-axis. (**Do Not Evaluate The Integral.**)

6(16pts) Given the same region as in Problem 5. Use the method of cylindrical shell to set up an integral for the volume of a different solid which is obtained by rotating the region R around the vertical line $x = -1$. (**Do Not Evaluate The Integral.**)

---

2 Bonus Points: The state fish of Nebraska is: (a) channel catfish; (b) rainbow trout; (c) snakehead; (d) bluegill. (*... The End*)