Name _____

Student ID # _____

Class Section _____

Instructor _____

Math 1210
Spring 2007

EXAM

Dept. Use Only Exam Scores		
Problem	Points	Score
1.	20	
2.	20	
3.	20	
4.	20	
5.	20	
	TOTAL	

Show all your work and make sure you justify all your answers.

Math 1210
Exam

1. Integrate the following problems

   (a) $\int f^{'}(g(x))g^{'}(x)dx$

   (b) $\int xcos(x^2)dx$

   (c) $\int cos(x)sin(sin(x))dx$

   (d) $\int x^2[x^3+5]^8 sin((x^3+5)^9)dx$

   (e) $\int x^3 + x + 4dx$

2. These problems involve the second fundamental theorem of calculus.

   (a) $\int_0^1 x dx$

   (b) $\int_\pi^0 cos(x)[sin(x)]^2 dx$

   (c) $\int_0^1 (2x+2)(2x^2+4x+99)^{95} dx$

3. These problems are on the first fundamental theorem of calculus.

   (a) Find $\frac{dG}{dx}$ Where $G(x) = \int_{sin(x)}^{x^2} cos(x)dx$

   (b) Find $\frac{dG}{dx}$ Where $G(x) = \int_{x}^{(x^2+x+1)^2} x^2 dx$

   (c) Find $\frac{dG}{dx}$ Where $G(x) = \int_{cos(x^2)}^{x^2} tan(x)dx$

4. Estimate the area under the curve $y = x^3$ from $x = 0$ to $x = 1$ with four rectangles. It may help to draw the picture.

5. find the exact number that the following sum equals $\sum_{k=0}^{N}(1/5)^k$

6. These problems are on differential equations. Either solve the separable differential equation or show that y is a solution to the differential equation.

   (a) Show that $y = k_1 cos(x) + k_2 sin(x)$ is a solution to the differential equation $y/sp'' + y = 0$

   (b) Solve $\frac{dy}{dx} = \frac{x}{y^3}$

   (c) Solve $\frac{dy}{dx} = x^2 y^3$

7. These problems are on the mean value thoerem for derivatives.

   (a) State and prove the mean value theorem for derivatives. (It is less likely that this question will be on the exam)

   (b) Let $f(x) = x^3$ find all values c so that the statement of the mean value theorem for derivatives holds on $[-1, 1]$

8. This question is on section 3.4 and will come from your homework. In particular 14, 23, 29,50.

9. Find the maxium and minium value of each of the following functions. Us the first or second derivative test to show it is a max or a min.

   (a) $f(x) = \frac{x^2}{x^2+1}$

   (b) $f(x) = x^3 - 3x$

   (c) $f(x) = x^4 - 2x$

   (d) $f(x) = x^2 + 4x + 4$ on $[-10, 10]$