MATH 155 — Quiz #1

February 6, 1995

Please make sure you received 2 pages (including this cover page) with 4 problems. You have 45 minutes for the exam, and you may attempt the problems in any order. You may use a one-page summary of your notes during this exam. No other help is allowed. Write your answers in the space provided. If you need more space, attach additional pages.

Good Luck!

Name:	
Student number:	

Problem	Maximum	Points received
1	40	
2	20	
3	20	
4	20	
Total	100	

Problem 1 Find an antiderivative F of the function f ($F(x) = \int f(x)dx$). Check the appropriate box for all correct answers. Note that at least one and at most two answers are correct. (10 points for each function, -1 for incorrect checks; -5 if more than two answers are checked for one example.) C is a generic constant. *Hint:* $\frac{d}{dx}\tan x = 1 + \tan^2 x$.

	$f(x) =$	$F(x) = \int f(x)dx =$	check		$f(x) =$	$F(x) = \int f(x)dx =$	check
a)	$3x + \frac{1}{3x}$	$\frac{3}{2}x^2 + \ln\lvert 3x\rvert + C$	☐	c)	$\tan^2 x$	$\tan x - 1 + C$	☐
		$\frac{3}{2}x^2 + \frac{1}{3}\ln\lvert x\rvert + C$	☐			$\tan x + x + C$	☐
		$\frac{3}{2}x^2 + \frac{1}{3}\ln\lvert 3x\rvert + C$	☐			$\tan x + C$	☐
		$x^3 + \frac{1}{3}\ln\lvert 3x\rvert + C$	☐			$\frac{1}{3}\tan^3 x + C$	☐
		None of the above	☐			None of the above	☐
b)	$3x^2 + 3x^{-2}$	$x^3 + 3x^{-1} + C$	☐	d)	$\ln(2x)$	$\frac{1}{2x} + C$	☐
		$x^3 - 3x^{-1} + C$	☐			$x\ln(2x) - x + C$	☐
		$x^3 - x^{-3} + C$	☐			$2x\ln(2x) - 2x + C$	☐
		$x^3 + x^{-3} + C$	☐			$x\ln x + x\ln 2 - x + C$	☐
		None of the above	☐			None of the above	☐

Problem 2 What are the values of the following definite integrals. Check the appropriate box (exactly one answer is correct). 10 points for each function, -1 for incorrect checks, -5 if more than one answer is checked

a)	$\int_{-1}^{+1}(x-x^3)dx$	$\frac{1}{2}$	☐	b)	$\int_0^\pi \sin x \cos x dx$	$\frac{1}{2}$	☐
		$\frac{1}{4}$	☐			0	☐
		$-\frac{1}{2}$	☐			π	☐
		$-\frac{1}{4}$	☐			1	☐
		None of the above	☐			None of the above	☐

Problem 3 What is ... (5 points each)

$$\frac{d}{dx}\left(\int_0^x e^{t^2}\,dt\right) =$$

$$\int_0^x \frac{d}{dt}(t^2-t)\,dt =$$

$$\frac{d}{dx}\left(\int_1^2 \ln t\,dt\right) =$$

$$\frac{d}{dx}\left(\int_x^2 t\,dt\right) =$$

Problem 4 Find the definite integral

$$\int_1^2 \frac{dx}{x(x+1)}.$$

Show your work (20 points).