THE UNIVERSITY OF MANITOBA

March 11, 2005 5:30 pm - 6:30 pm

DEPARTMENT & COURSE NO: 136.170
EXAMINATION: Calculus II

TEST 2
TITLE PAGE
TIME: 1 HOUR
EXAMINER: (Identified Below)

NAME: (PRINT) _____

STUDENT NUMBER (IN INK): _____

SIGNATURE (IN INK): _____
(I understand that cheating is a serious offense)

IMPORTANT:
Please indicate your instructor and section by placing a check mark in the appropriate box below.

SECTION		TIME	INSTRUCTOR
☐ L03	M,W,F	9:30 - 10:20	R. G. Woods
☐ L04	M,W,F	11:30 - 12:20	E. Samei
☐ L05	Tues, Thurs.	1:00 - 2:15	N. Harland
☐ L92	Challenge for Credit		

INSTRUCTIONS TO STUDENTS:
*This is a 1 hour exam. Please show your work **clearly**.*

No calculators, texts, notes or other aids are permitted.

This exam has a title page, 5 pages of questions and 1 blank page for rough work. Please check that you have all the pages. You may remove the blank page if you want, but be careful not to loosen the staple.

The value of each question is indicated in the left-hand margin beside the statement of the question. The total value of all questions is 40.

Answer all questions on the exam paper in the space provided beneath the question. If you need more room, you may continue your work on the reverse side of the page, but CLEARLY INDICATE that your work is continued.

DO NOT WRITE IN THIS COLUMN
1. _____ / 8
2. _____ / 8
3. _____ /12
4. _____ / 4
5. _____ / 8
TOTAL _____ /40

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Page 1 of 5
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[8] 1. (a) Find the points of the intersection of the curves $y = 2x^2$ and $y = 3 - x^2$.

(b) Find the area of the region enclosed by the curves $y = 2x^2$, $y = 3 - x^2$, $x = -2$, and $x = 0$.

continued…

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[8] 2. Find the area of the region that lies inside $r = 1 + \sin\theta$ and outside $r = 2 - \sin\theta$.

continued…

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[12] 3. Let S be the region in the plane enclosed by the curves $y = x^2 + 1$ and $y = 1 - x$.

(a) Find the volume obtained by rotating S around the x-axis.

continued…

(b) Find the volume obtained by rotating S around the y-axis.

[4] 4. Evaluate $\frac{d}{dx}\tan^{-1}\left(x^4\right)$ when $x=2$. Is your answer larger than $\frac{1}{8}$?

continued…

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[8] 5. Integrate, using any appropriate method.

(a) $\int_1^2 \frac{1}{x^2} \sin\left(\pi + \frac{\pi}{x}\right) dx$

(b) $\int (2x-1)\, e^{-x}\, dx$