UNIVERSITY OF MANITOBA
DEPARTMENT OF MATHEMATICS

MATH 1710 Applied Calculus II
FIRST TERM EXAMINATION
March 9, 2011 5:30 pm

LAST NAME: _____

FIRST NAME: _____

STUDENT NUMBER: _____

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

Please indicate your instructor and section by checking the appropriate box below:

☐ A01 MWF (8:30 – 9:20) M. Despic

☐ A02 TR (13:00 – 14:15) A. Prymak

INSTRUCTIONS TO STUDENTS:

Fill in all the information above.

This is a 1 hour exam.

You are permitted to bring one information page (21.6cm. by 28.0 cm. or 8.5 in. by 11 in.) which may contain information on one side only, must be hand-written (not mechanically reproduced) and must bear your name and the student identification number. Information pages not meeting these criteria will be confiscated. ***No*** *other aids, calculators, texts, notes or cellphones are permitted.*

Show your work clearly *for full marks.*

This exam has a title page, 3 pages of questions and 1 blank page at the end for rough work. Please check that you have all pages.

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 58.

Answer all questions on the exam paper in the space provided. 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 there.*

Question:	1	2	3	4	5	Total
Points:	9	10	10	10	19	58
Score:						

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[9] **1.** Simplify the following expressions as much as possible, showing all your work:

(a) $\tan\left[\text{Sin}^{-1}\left(\frac{7}{8}\right)\right]$

(b) $\cot\left[\text{Csc}^{-1}\left(\frac{-11}{5}\right)\right]$

[10] **2.** Find $\frac{dy}{dx}$ for each of the following functions. (You do not need to simplify your answer.)

(a) $y = \text{Tan}^{-1}\left[2 + \text{Cos}^{-1}(3x)\right]$

(b) $y = e^{\sqrt{\text{Sin}^{-1}(7x)}}$

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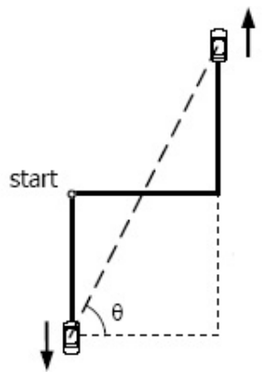
[10] **3.** The curves

$$y = \sin x \left(0 \le x \le \frac{\pi}{2}\right), \quad x = \frac{\pi}{2}, \quad \text{and} \quad y = 0$$

determine a thin plate with constant mass per unit area ρ. Set up (but DO NOT EVALUATE) a definite integral to determine the moment of inertia of the plate about the line $y = -1$.

[10] **4.** A car drives south at 30 km/h. Another car, starting from the same point at the same time and traveling 60 km/h, goes east for 40 minutes then turns north. Find the rate of rotation (in rad/h) of the line joining the cars 1 hour after the start.



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[19] **5.** Find the centroid of the region bounded by the curves: $y = \sqrt{x}$, $x = y + 2$, and $y = 0$.

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