

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:

<input type="checkbox"/>	A01	MWF (8:30 – 9:20)	M. Despic
<hr/>			
<input type="checkbox"/>	A02	TR (13:00 – 14:15)	A. Prymak
<hr/>			

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:						

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

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

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

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

(a) $y = \tan^{-1} [2 + \cos^{-1}(3x)]$

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

DATE: March 9, 2011

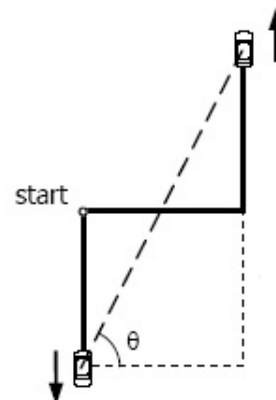
PAGE: 2 of 4

DEPARTMENT & COURSE NO: MATH 1710TIME: 1 hourEXAMINATION: Applied Calculus IIEXAMINER: various[10] **3.** The curves

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

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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FIRST TERM EXAMINATION

DATE: March 9, 2011

PAGE: 3 of 4

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TIME: 1 hour

EXAMINATION: Applied Calculus II

EXAMINER: various

- [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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