

MATH 1500: Introduction to Calculus

May-June Day 2010

Instructor: Rob Borgersen Office: 425 Machray Hall
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Office Hours: TBA

Lectures: M-F 10:45-11:45, 205 Armes. Last class: Tues, June 22nd
No classes on May 24th, May 27th, or May 28th.

Tutorials: MWF 9:40 - 10:30am **First Lab: May 7th** **Last Lab: June 21st**

Textbook: James Stewart, Single Variable Calculus, Early Transcendentals, 6th ed,
2008. Metric International Version.

Voluntary Withdrawal Deadline: Thursday June 10th

Course Outline

See attached for outline and suggested homework problems.

Student Evaluation

Four quizzes in lab time: May 12 th , May 19 th , June 2 nd , June 11 th	10%
One one-hour midterm exam in class time and place: May 26 th	35%
Final exam: Fri June 25 th , 9:00-11:00am (Location: TBA).....	55%

Course web page: <http://www.robertborgersen.info/Math1500/>

Further Information

For important further information regarding the quizzes and the midterm exam, students are directed to see the “Test & Tutorial Information” document available on the website (above).

Cheating and Academic Dishonesty

Students are advised to familiarize themselves with the University policy concerning “plagiarism and cheating” and “examinations – impersonations” appearing in the General Calendar.

The Department of Mathematics, the Faculty of Science and the University of Manitoba regard acts of academic dishonesty in quizzes, tests, examinations or assignments as serious offenses and may assess a variety of penalties depending on the nature of the offense.

Acts of academic dishonesty include bringing unauthorized materials into a test or exam, copying from another student, plagiarism and examination personation. Students are advised to read section 7 (Academic Integrity) and section 4.2.8 (Examinations: Personations) in the

"General Academic Regulations and Requirements" of the current Undergraduate Calendar. Note, in particular that cell phones and pagers are explicitly listed as unauthorized materials, and hence may not be present during tests or examinations.

Penalties for violation include being assigned a grade of zero on a test or assignment, being assigned a grade of "F" in a course, compulsory withdrawal from a course or program, suspension from a course/program/faculty or even expulsion from the University. For specific details about the nature of penalties that may be assessed upon conviction of an act of academic dishonesty, students are referred to University Policy 1202 (Student Discipline Bylaw) and to the Department of Mathematics policy concerning minimum penalties for acts of academic dishonesty.

The Student Discipline Bylaw is printed in its entirety in the Student Guide, and is also available on-line or through the Office of the University Secretary. Minimum penalties assessed by the Department of Mathematics for acts of academic dishonesty are available on the Department of Mathematics web-page.

All Faculty members (and their teaching assistants) have been instructed to be vigilant and report incidents of academic dishonesty to the Head of the Department.

COURSE OUTLINE

Textbook: *Calculus, Early Transcendentals* (Metric International Edition) by James Stewart, 6th ed., 2008.

Sect	Topic	Homework (odd numbers only)
1.1	Four ways to represent a function.....	21—45, 65—69
1.3	New functions from old functions (combinations/compositions only)	29—31, 39—41, 45, 49, 55
1.5	Exponential functions.....	5—11
2.2	Limit of a function.....	5, 7, 9, 12
2.3	Limit laws.....	1—29, 35—47
2.5	Continuity.....	9, 11, 31—43, 32, 42, 47, 49
2.6	Limits at infinity: horizontal asymptotes.....	15—35, 39, 41, 43, 53, 57
2.7	Derivatives & other rates of change.....	21—37
2.8	The derivative as a function.....	19—29, 45
3.1	Derivatives of Polynomials & Exponential functions.....	3—35, 45, 49—57
3.2	Product & Quotient rules.....	1—31, 41—45
3.3	Derivatives of Trigonometric functions.....	1—15, 21, 23, 29, 33, 39—47
3.4	Chain rule.....	1—53, 61—71
3.5	Implicit differentiation (omit inverse trig. functions).....	1—29, 42, 43
3.9	Related rates.....	1—29
1.6	Inverse and Logarithmic functions.....	21—27, 33—39, 47, 49
3.6	Derivatives of logarithmic functions.....	1—33, 37—49
4.1	Max and Min values.....	47—62
4.2	Mean Value Theorem.....	11—15, 24
4.3	How Derivatives affect the shape of a graph.....	9—21, 45, 47
4.5	Curve Sketching (omit oblique asymptotes).....	5—23
4.7	Optimization Problems.....	1—19, 31, 33, 35
4.9	Antiderivatives.....	1—19, 23—33, 57—61
5.1	Areas and Distances.....	
5.2	Definite integral.....	41, 43, 47, 49, 53
5.3	Fundamental Theorem of Calculus.....	7, 9, 11, 15, 53—56

REQUIRED THEOREMS

- 2.9 Differentiable functions are continuous
- 3.1 $(cf)' = cf'$
- 3.1 $(f + g)' = f' + g'$
- 3.2 $(fg)' = f'g + fg'$
- 3.4 $(\sin(x))' = \cos(x)$
- 4.2 $f' = 0$ on I implies f is constant on I
- 4.3 $f' > 0$ on I implies f is increasing on I
- 4.3 $f' < 0$ on I implies f is decreasing on I