

Moravian College
Math 106 – Analytic Geometry and Calculus with Review-Part I
Fall 2014

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Office hours: M, W, F 8-8:45 a.m. Other times by appointment.

Course Materials – *Calculus, Single Variable, 2nd Edition* by Jon Rogawski

A Companion to Calculus, 2nd Edition by Ebersole, Schattschneider, Sevilla, Somers
Calculator: The TI 83+ or TI 84+ calculator is recommended and will be used for presentations, but any comparable graphing calculator with which the student is familiar with is acceptable. Please refrain from using your cell phone or smartphone during class. NOTE: for all tests and quizzes electronic devices (cell phones, smartphones, laptops, iPads, etc.) must be away and are NOT permitted to be used.

Course Goals – Each student will

- review mathematical concepts and techniques needed to successfully study calculus.
- reinforce their understanding of the meaning of a function.
- work with functions algebraically, numerically and graphically.
- be introduced to the concepts of limits and continuity of functions.
- develop the notion of a derivative as both a rate of change and as the slope of a tangent to a curve.
- learn techniques for finding derivatives of algebraic and exponential functions.
- be able to find the derivative of an implicit function.
- relate all concepts studied to real world problems.
- use the graphing calculator as a tool for visualizing calculus concepts.

Attendance – Regular attendance is necessary in order to be most successful. Poor attendance will affect a student's class participation grade. Make-ups for tests and quizzes will be given only for excused absences. An excused absence is one that is okayed by the professor before the test or one for which a medical excuse can be produced. Students are responsible for all work covered in class and all assignments, even if they are absent from class.

Homework – Working together: When faced with difficulty in mathematics, it helps to work through a problem with a colleague. I welcome and encourage you to work with friends, tutors and myself in working through completing homework assignments. When you work through the problems connected with each reading, you are welcome and encouraged to work with your friends and classmates. Feel free to exchange ideas as you work through the problems. HOWEVER: when writing your homework response, you must work on your own. The final response you write on your homework should be yours and yours alone. I recommend that while you may complete the scratch work for all of your homework with a classmate, you should write the final copy of your homework when you are alone. Ultimately, YOU are responsible for understanding how to find a solution to each assigned problem.

Student Expectations – Students should be spending approximately ten hours per week outside of scheduled class times on assigned reading and exercises, completing graded problem sets and studying for quizzes and tests.

After completing this course, students are expected to be able to

- identify functions and their domains using both algebraic and graphical methods
- find the limits of algebraic functions numerically and algebraically
- be able to discuss limits and continuity of functions in relation to their graphs
- determine horizontal and vertical asymptotes of rational functions
- find the derivative of polynomial, rational, and exponential functions
- be able to use the product and quotient rules for derivatives
- find derivatives using the chain rule
- find the tangent lines to functions at given points using derivatives
- use derivatives to find velocity and acceleration in rectilinear motion problems.
- find average and instantaneous rates of change in various situations
- understand functions implicitly defined and determine their derivatives

Evaluation and Grading – Practice is vital for developing the required Calculus skills. It is necessary that the student does all homework exercises assigned. In addition to the daily assignments (not graded) there will be graded homework assignments approximately every two weeks. **These assignments will be graded with a 20% penalty for each day that they are late.** The students grade will be determined on the basis of three exams, four quizzes, six graded homework assignments, class participation, and a cumulative final exam.

Final grades will be computed based on the weights below*.

- Graded homework (15%)
- Quizzes (15%)
- Tests (45%)
- Cumulative final exam (25%)

The Final grade will be based on the following rubric.

Average	Grade
$x \geq 92$	A
$90 \leq x < 92$	A-
$88 \leq x < 90$	B+
$82 \leq x < 88$	B
$80 \leq x < 82$	B-
$78 \leq x < 80$	C+
$72 \leq x < 78$	C
$70 \leq x < 72$	C-
$68 \leq x < 70$	D+
$62 \leq x < 68$	D
$60 \leq x < 62$	D-
$x < 60$	F

*For borderline cases, class participation will help decide the Final Grade. It is important to remember that class attendance has a definite effect on how I view your class participation.

Disclaimers – This syllabus is subject to change through the semester. Any updates to the syllabus will be announced in class. The instructor reserves the right to apply qualitative judgment in determining final grades for the course.

Learning Disability Accommodations – Students who wish to request accommodations in this class for a disability must contact Ms. Elaine Mara, assistant director of academic support services for academic and disability support, at the lower level of Monocacy Hall, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

Mathematics Department Academic Honesty Policy – The Mathematics Department supports and is governed by the Academic Honesty Policy of Moravian College as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics Department faculty.

In all at-home assignments which are to be graded, you may use your class notes and any books or library sources. **When you use the ideas or thoughts of others, however, you must acknowledge the source. You also may not use a solution manual** or the help (orally or in written form) of any individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources, you will be violating the Academic Honesty Policy of Moravian College. **You may work with your fellow students on homework which is not to be graded. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and un-graded.**

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by your instructor for a particular test

Math 106 Course Outline Fall 2014

Topic	Rog.	CTC	Daily Assignments (Tentative)
Real Numbers, Functions and Graphs	1.1		Pg 10-12 # 3,5,7,9,15,37,41-47 odd, 53-59 odd
The Cartesian Coordinate Plane		1-A	Pg 13 # 1,3
Graphs		1-B	Pg 18 # 1-3
Distance Between Two Points		1-E	Pg 32 # 1,2
The Circle		1-F	Pg 35 # 4,5
Function Notation		2-A	Pg 44 # 2,4
Interval Notation		2-B	Pg 48 #1,2
The Graph of a Function		2-D	Pg 60 # 3
Linear and Quadratic Functions	1.2		Pg 19-20 # 1-19 odd, 33, 43, 51
Lines and Their Equations		1-C	Pg 25 * 3
Parallel and Intersecting Lines		1-D	Pg 29 # 3, 4 Exercises Pg 35-37 # 1,7,13
QUIZ 1			
The Basic Classes of Functions	1.3		Pg 25 # 1-7 odd, 27, 29
Transformations of Graphs		2-F	Pg 82 # 1, 4
Combinations of Functions		3-A	
Inverse Functions	1.5		Pg 41-42 # 5, 9, 11
One-To-One Functions		14-A	Pg 359 # 4
Properties of a Function and its Inverse		14-B	Pg 366 # 6
Finding the Inverse Function		14-C	Pg 376 # 1
Exponential and Logarithmic Functions	1.6		Pg 50-51 #1-27 odd
Negative and Rational Exponents		7-A	Pg 219-220 # 1
Rules of Exponents		13-A	Pg 343 #3, 5,10
The Natural Exponential Function		13-B	Pg 349-350 # 1, 5
Def. and Prop. of Logarithmic Functions		15-A	Pg 385 # 2
Solving Eq with Logs and Exponents		15-C	Pg 396 # 1
TEST 1			(Tentatively September 19)
Limits, ROC and Tangent Lines	2.1		Pg 64-66 # 1, 7, 11, 15, 25
Limits: Numerically and Graphically	2.2		Pg 74-76 # 1, 3, 17, 47,49,51,53
Basic Limit Laws	2.3		Pg 80 # 1-21odd,27,29
Limits and Continuity	2.4		Pg 88-89 #1,3, 17, 49, 51, 57,63,65, 67, 69, 73, 75
Companion to Continuous Functions		CTC	Pg 141 # 3, 4 Pg 159-160 # 13, 15
QUIZ 2			
Intermediate Value Theorem	2.8		Pg 109 # 1, 9
Zeros of a Function		4-B	Pg 150 #2,5,6,7
Algebraic Simplification of Functions		3-B	Pg 110-111 # 7bc (Simplify)
Evaluating Limits Algebraically	2.5		Pg 94-95 # 1-17 odd, 21,25,37,38,, 45, 49, 51
Limits at Infinity	2.7		Pg 105 # 1 ,7-19 odd, 23
Graphical Interpretation		5-A	Page 171-172 # 1 3, 4, 6, 7
Horizontal Asymptotes		5-B	Pg 179 # 1-4
Vertical Asymptotes			Pg 183 # 1, 3
TEST 2			(Tentatively October 22)

Topic	Rog.	CTC	Daily Assignments (Tentative)
Definition of the Derivative	3.1		Pg 125-126 # 3, 6, 19, 27, 29, 33, 49, 59
The Derivative as a Function	3.2		Pg 139-142 # 1-35 odd, 39, 41, 45, 51, 53, 71, 73
QUIZ 3			
Product and Quotient Rules	3.3		Pg 147 #1, 3, 7-19 odd, 23, 31, 33, 39, 41, 47
Rates of Change	3.4		Pg 156-157 # 1-7 odd, 13, 15, 21, 23, 47
Applications (JUST PROBLEMS)	3.1	6-B	Pg 203 # 4,5,6
Higher Derivatives	3.5		Pg 163 # 1-19 odd, 37, 39
TEST 3			(Tentatively November 17)
The Chain Rule	3.7		Pg 174 #9-15 odd, 25, 31, 33, 35, 47
Simplifying Derivatives		7-C	Pg 227 # 3, 4
Implicitly Defined Functions		9A	Pg 288 # 2ade
Solving Equations with dy/dx		9B	Pg 291-292 # 1bc, 2bc, 3bc
Implicit Differentiation	3.10		Pg 192 # 9, 17, 19, 31, 39
Chapter Review	CR		Pg 204-205 # 29, 33, 35, 37, 55, 57, 85, 87, 91, 95, 97, 101
QUIZ 4			
FINAL EXAM:			106B: Tuesday, December 9 - 8:30 am
			106C: Monday, December 8 - 8:30 am