

**Math 1a**  
**Introduction to Calculus**  
**Spring 2004**

***Course Details***

**Staff**

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Office hours: 1:00-2:00pm Tuesdays and Fridays

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**Topics**

- Functions
- Limits
- Derivatives
- Applications
- Introduction to Integration

**Prerequisites**

Precalculus. This includes algebra, the basics of graphing, and acquaintance with trigonometric and exponential functions. If you are concerned about meeting prerequisites, you may take an online placement test at <http://spade.fas.harvard.edu/placement>.

**Section Meetings**

This course meets Mondays, Wednesdays, and Fridays at 10:00am in Science Center 309. Unlike other courses taught in the calculus sequence this semester (Xb, 1b, 21a, 21b), we meet in a single section. No sectioning by computer is required.

## Homework

Homework will be assigned each class meeting and due the next class meeting. It will be returned, graded, at the following class meeting. Solutions will be made available on the course web site. Late homework will not be accepted. The lowest three homework scores will be dropped.

Homework problems are themselves an extension of the course material. Cure yourself of the idea that there is a limited number of “types” of problems in mathematics and that your instructor is responsible for showing you how to do each type. Some problems will require you to apply the concepts of the lecture to solve problems not explicitly covered in class.

By all means you may work in groups on the homework assignments. However, each student must turn in his or her own write-up of the solutions, with an acknowledgment of collaborators. This is in line with good habits of scholarship in general.

## Exams

There are two midterm exams, one on Friday, March 12, and one on Monday, April 26. The final exam is tentatively scheduled for Friday, May 21, 2004. *No calculators will be allowed on the exams.*

Exams are to test your mastery of the course topics. Exam problems *may* be like homework problems but may also synthesize various parts of the course.

## Grades

Your course grade will be determined as the following weighted average:

40%	Final
20%	Midterm I
25%	Midterm II
15%	Homework
<b>100%</b>	<b>Total</b>

## Text

*Single Variable Calculus, Concepts and Contexts* by James Stewart, 2<sup>nd</sup> edition, ISBN 0-534-37862-5. Available at the Harvard Coop or various online bookstores.

There is a [companion web site](#)<sup>1</sup> to the text, and you may find the [Review of Algebra](#)<sup>2</sup> linked there useful.

You might also consider buying a refresher book on precalculus such as Schaum's Outline.

## Calendar

Date	Section(s)	Topics
2/4 (W)	1.1	Four ways to represent a function
2/6 (F)	1.2	Mathematical models
2/9 (M)	1.3	New functions from old
2/11 (W)	1.4	Graphing calculators and computers
2/13 (F)	1.5–1.6	Exponential functions, inverse functions, logarithms
2/16 (M)		<b>No class (Presidents' Day)</b>
2/18 (W)	2.1–2.2	Tangents and velocities, Limits of functions
2/20 (F)	2.3	Limit laws
2/23 (M)	2.4	Continuity
2/25 (W)	2.5	Limits involving infinity
2/27 (F)	2.6	Tangents, velocities, and other rates of change
3/1 (M)	2.7	Derivatives
3/3 (W)	2.8	The derivative as a function
3/5 (F)	2.9	Linear Approximation
3/8 (M)	2.10	What does $f'$ say about $f$ ?
3/10 (W)		<b>Review</b>
3/12 (F)		<b>Midterm I</b>
3/15 (M)	3.1	Derivatives of polynomials and exponential functions
3/17 (W)	3.2	The product and quotient rules
3/19 (F)	3.3	Rates of change in the natural and social sciences
3/22 (M)	3.4	Derivatives of trigonometric functions
3/24 (W)	3.5	The chain rule
3/26 (F)	3.6	Implicit differentiation
3/27–4/4		<b>Spring Break</b>
4/5 (M)	3.7	Derivatives of logarithmic functions
4/7 (W)	4.1	Related rates
4/9 (F)	4.2	Maximum and minimum values
4/12 (M)	4.3	Derivatives and the shape of curves
4/14 (W)	4.5	Indeterminate forms and L'Hôpital's Rule
4/16 (F)	4.6	Optimization Problems
4/19 (M)	4.7	Applications to Economics
4/21 (W)	4.8	Newton's Method
4/23 (F)		<b>Review</b>
4/26 (M)		<b>Midterm II</b>
4/28 (W)	5.1	Areas and distances
4/30 (F)	5.2	The definite integral
5/3 (M)	5.3	Evaluating definite integrals
5/5 (W)	5.4	The fundamental theorem of calculus
5/7 (F)	5.5	The substitution rule

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<sup>1</sup> [http://www.brookscole.com/cgi-brookscole/course\\_products\\_bc.pl?fid=M20b&product\\_isbn\\_issn=0534378625&discipline\\_number=1](http://www.brookscole.com/cgi-brookscole/course_products_bc.pl?fid=M20b&product_isbn_issn=0534378625&discipline_number=1) is the full URL of the text's companion web site.

<sup>2</sup> [http://www.brookscole.com/math\\_d/templates/student\\_resources/shared/Review\\_of\\_Algebra.pdf](http://www.brookscole.com/math_d/templates/student_resources/shared/Review_of_Algebra.pdf) is the URL of the algebra primer