

MATH 104: PRECALCULUS

Fall 2011

Instructor: Dr. Ruzanna Baytaryan

Office: HSLH 341 **Phone:** 661-362-5916

Office Hours: TTH 2:30-3:30PM and by appointment

Email: Ruzanna.baytaryan@canyons.edu

Website: <http://www.canyons.edu/users/baytaryanr>

Textbook and Supplies

Text: *Precalculus: A problem –Oriented Approach;*
Cohen, D 7th Ed.

Supplies: You may need a graphing calculator for some homework exercises and for checking your work.

However, no calculators will be used on tests or final exam.

Course Description: Review of equations and inequalities, linear, quadratic, radical, rational, exponential, logarithmic, and trigonometric functions. Graphing various functions using transformations and properties. Solving higher degree polynomial equations. Solving systems of linear and nonlinear equations and inequalities. Applications of optimizations and operations with functions. Discussion of sequences and series, the Binomial Theorem, and mathematical induction. Designed to prepare the student for calculus series.

Mother of all the sciences,
mathematics is a builder of the
imagination, weaver of
patterns of sheer thought, an
intuitive dreamer, a poet. The
study of mathematics cannot
be replaced by any other
activity...

American Mathematical Monthly

Student Learning Outcomes:

By the completion of the course a student should be able to

- 1. Analyze and graph polynomial, rational, logarithmic, exponential and trigonometric functions.**
- 2. Recognize, analyze and solve problems involving functions**

Homework

- ❖ Homework will be assigned at the end of each class period. However, it will be collected on exam days before you begin the exam.
- ❖ Please start each new section of homework on a new page with the section number clearly written in the upper right corner of that page.
- ❖ Staple your homework together before you turn it in.
- ❖ 5-15 random problems from homework will be chosen and graded for accuracy.
- ❖ You must show your work in order to receive homework credit.
- ❖ In general, I do not accept late homework.
- ❖ This is a college class, so you are expected to spend about two hours per day outside of class working on the course material. Moreover, for more students, there is a direct correlation between the effort made to complete homework assignments and mastery of the material. Motivation, tenacity, and positive attitudes are keys to an individual's success. So, let's succeed!

Group- work:

Most days in class you will be assigned to work with a group 2 or 3 other students. Problems will be assigned for -your group to work on. Each group will submit one set of solutions for each assignment. **No makeup group-work will be given under any circumstances.**

Exams

You will have four chapter exams and a comprehensive final exam. **Do not miss them! No makeup tests will be given under any circumstances.** Your lowest test score may be replaced by your final exam score to improve your final grade.

I strongly recommend that you keep all homework and exams until you receive your course grade in case you have questions regarding your grade.

Grading

Your final grade will be computed from your homework, chapter tests, and your final exam scores. Any missing exam will be scored zero. The following grade-calculation grid will be used to determine your final grade.

	Grade Percentage		Weight		Total
Homework/GroupWork - Average		X	15% (0.15)	=	
Chapter Exam - Average		X	60% (0.60)	=	
Final Exam		X	25% (0.25)	=	
Overall grade percentage in class					

Grading Scale: A = 90 – 100% C = 70 – 79% F = Below 60%
 B = 80 – 89% D = 60 – 69%

A grade C or higher is required in order to continue with Math 211.

Attendance

We have a lot of material to cover and understand, so regular attendance is crucial to your success in the class. Please come on time and stay for the duration of the class. If you cannot attend regularly, on time, and stay for the entire class, you should take this class at another time that fits your schedule. Students arriving late or leaving early, without authorization from the instructor, may be marked tardy. Two recorded tardies will count as one absence. Excessive absences (3 or more) may result in being dropped from the class.

Expectations

A collaborative and respectful environment is anticipated. I expect you to come to class with a commitment to learn and to take responsibility for your learning. This means participating in the discussions and in-group work, taking notes, and helping others to learn. Please ask questions and let me know if you have difficulties. If you feel you may need an accommodation based on the impact of a disability, please contact me privately to discuss your specific needs. You will be asked to leave if you engage in any inappropriate behavior during class. Cell phones are to be turned off during class.

Academic Assistance

You should visit the TLC lab. Tutors and instructors are waiting there, eager to help you. The computer software that accompanies your text is available there.

MATH 104 LECTURE OUTLINE MW

This schedule is tentative. It is subject to change.

Week 1	08/22/11 Introduction Review: 8.3	08/24/11 Review: 8.5, 9.4, 9.5
Week 2	08/29/11 Review: 10.5, 10.6, 10.7	08/31/11 Review: 1.4, 1.5, 1.6
Week 3	09/05/09 LABOR DAY	09/07/11 Test-1 (8.3, 8.5, 9.4, 9.5, 10.5, 10.6, 10.7)
Week 4	09/12/11 Review: 1.7, 2.1, 2.2	09/14/11 Review: 2.3, 2.4
Week 5	09/19/11 3.1, 3.2	09/21/11 3.3, 3.4
Week 6	09/26/11 3.5, 3.6	09/28/11 4.4, 4.5
Week 7	10/03/11 Test-2 (1.4-1.7, 2.1-2.4, 3.1-3.6)	10/05/11 4.6, 4.7
Week 8	10/10/11 5.1, 5.2	10/12/11 5.3, 5.4
Week 9	10/17/11 5.5, 5.6	10/19/11 5.7, 11.3

Week 10	10/24/11 Test-3 (4.4-4.7, 5.1-5.7)	10/26/11 11.4, 11.5
Week 11	10/31/11 11.6, 12.1, 12.2	11/02/11 12.3, 12.4
Week 12	11/07/11 12.5, 12.6	11/09/11 13.2, 13.3, 13.4
Week 13	11/14/11 Test-4 (11.3-11.6, 12.1-12.6)	11/16/11 13.5, 13.7
Week 14	11/21/11 14.1, 14.2	11/23/11 14.2, 14.3
Week 15	11/28/11 14.4, 14.5	11/30/11 Test-5 (13.2-13.7, 14.1-14.5)
Week 16	12/05/11 Review for Final	12/07/11 FINAL EXAM

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HOMEWORK ASSIGNMENT SHEET

Fall 2011

Sections and Topics	Problems
<i>Chapter 1: Fundamentals</i>	
1.4 Rectangular Coordinates. Visualizing Data	13, 16, 18, 19, 25
1.5 Graphs and Graphing Utilities	9, 11, 13, 21, 23, 25c, 27c, 29c, 37, 39, 41, 43
1.6 Equations of Lines	5, 7, 11-29odd, 41, 49, 53
1.7 Symmetry and Graphs. Circles	1-25odd, 47, 49, 55-61odd, 67
<i>Chapter 2: Equations and Inequalities</i>	
2.1 Quadratic Equations. Theory and Examples	10, 14, 18, 29, 31, 35, 37, 39, 42, 43-49odd, 51, 56, 69
2.2 Other Types of Equations	4, 6, 9, 19, 29, 31, 47, 51, 57, 70, 71, 74, 89, 91,
2.3 Inequalities	6, 7, 10, 20, 27, 38
2.4 More on Inequalities	1, 13, 21, 29, 33, 37, 49, 57, 81, 82
<i>Chapter 3: Functions</i>	
3.1* The Definition of a Function	9-23odd, 33, 35, 37, 45-48all, 49-59odd
3.2* The Graph of a Function	1, 5, 9, 11, 12, 19, 23-29odd, 33, 35
3.3* Shapes of Graphs. Average Rate of Change	1, 2, 4, 9-15odd, 21-31odd, 41, 43
3.4* Techniques of Graphing	1-39 odd
3.5* Methods of Combining Functions. Iteration	1, 2, 7, 11, 13, 18, 19, 21, 23, 24, 27, 29, 31, 49
3.6* Inverse Functions	3, 5, 7, 11, 15, 19, 21-27 odd, 37, 41, 43, 45
<i>Chapter 4: Polynomial and Rational Functions. Applications to Optimization</i>	
4.4* Setting Up Equations That Define Functions	1, 3, 7, 12, 19, 21, 33, 39, 41, 47
4.5* Maximum and Minimum Problems	1, 5, 7, 11, 13, 17, 21, 27, 29, 31, 33, 43, 45
4.6 Polynomial Functions	3, 11-23odd, 27, 31, 33, 39, 41, 43
4.7 Rational Functions	9, 13, 17, 21, 25, 27, 29, 39, 41, 43, 45

Chapter 5: Exponential and Logarithmic Functions

5.1 Exponential Functions	3-31odd, 39, 41, 45
5.2 The Exponential Function $y = e^x$	13, 17, 23, 31, 35-41 odd, 55, 61, 63
5.3 Logarithmic Functions	1-4all, 5- 45 odd, 49, 51, 53
5.4 Properties of Logarithms	1-9 odd, 13-27odd, 51-63 odd, 71, 72, 73, 77, 81, 83
5.5 Equations and Inequalities with Logs and Exponents	1-41 eoo, 43-55 odd, 61, 63, 71, 72, 73, 77, 81, 83
5.6 Compound Interest (<i>Optional</i>)	1-25odd
5.7 Exponential Growth and Decay (<i>Optional</i>)	7, 9, 11, 20, 25, 27, 29, 33, 35, 39, 45, 49, 55, 57, 59

Chapter 7: Trigonometric Functions of Real Numbers

8.3 Graphs of $y = A\sin(Bx-C)$ and $y = A\cos(Bx-c)$	3, 5, 7, 17-31odd
8.5 Graphs of Tangent and the Reciprocal Functions	1- 9odd, 21, 23, 29, 35, 37, 43

Chapter 8: Analytical Trigonometry

9.4 Trigonometric Equations	5-21odd, 39, 41, 45-51odd, 75-81odd
9.5 Inverse Trigonometric Functions	1-19odd, 25-33odd, 35, 37, 43, 45, 59, 63, 65, 67

Chapter 9: Additional Topics in Trigonometry

10.5* Parametric Equations	9-17odd
10.6 Introduction to Polar Coordinates	1, 3, 5, 6, 7-23odd
10.7 Curves in Polar Coordinates	13-27odd, 36, 37

Chapter 10: Systems of Equations

11.2 Gaussian Elimination (<i>Optional</i>)	11-29oss, 39
11.3* Matrices	9, 13, 17, 21, 23-51 eoo, 57
11.4 The Inverse of a Square Matrix	1, 5, 17, 19, 25, 33, 35
11.5 Determinants and Cramer's Rule	3, 5, 15, 17, 19, 33, 35, 37, 39, 43, 51, 55, 58
11.6 Nonlinear Systems of Equations (<i>Optional</i>)	3, 7, 11, 13, 17, 19, 22, 37, 39, 40

Chapter 11: The Conic Sections

12.1 The Basic Equations (<i>Optional</i>)	8, 9, 11, 13, 17, 21, 25, 27, 28, 29, 39, 45
12.2 The Parabola	11, 13, 17, 19, 25, 29, 31, 33, 35, 37, 39, 43

12.4 The Ellipse	1, 7, 17, 19, 23-35odd, 43, 46, 49, 51
12.5 The Hyperbola	9, 15, 21, 23-39odd, 44, 49
12.6 The Focus-Directrix Property of Conics	1-15odd
<i>Chapter 12: Roots of Polynomial Equations</i>	
13.2 The Remainder and the Factor Theorems	5, 11, 13, 21, 23, 31, 37, 47-53odd, 55, 57
13.3 The Fundamental Theorem of Algebra	1, 13, 15, 17, 19, 24, 31, 33, 35, 39, 42, 45
13.5 Rational and Irrational Roots	3, 5, 9, 13, 17, 19, 23, 25, 29, 31, 33
13.5 Conjugate Roots and Descartes' Rule of Signs	5, 11, 13, 17, 19, 25, 34, 37, 41, 43, 44
12.7* More About Partial Fractions	7, 11, 15, 17, 25, 29, 33, 39, 47, 53
<i>Chapter 13: Additional Topics in Algebra</i>	
14.1* Mathematical Induction	3, 5, 9, 13, 15, 17, 19, 21, 35, 37
14.2 The Binomial Theorem	4, 10, 13, 17, 23, 25, 28, 29, 39- 49 odd
14.3 Introduction to Sequences and Series	11, 13, 17, 18, 21, 23, 29, 37, 39, 43, 45, 49-61odd,
14.4 Arithmetic Sequences and Series	2, 3, 7, 9, 11, 13, 16, 19, 21-29 odd,35
14.5 Geometric Sequences and Series	1, 3, 9, 11, 13, 14, 17, 19, 21, 27, 29, 31, 35

Note: *The most important sections