



WALSH UNIVERSITY  
School *for* Professional Studies

# Math 155

## Elementary Functions

Assignment due on the first night of class  
see page 4

Prerequisite: Math 104: Algebra or equivalent  
proficiency

# Precalculus

## Course Description

Precalculus is designed to extend the basic skills of algebra and to introduce the process of analysis. As its name implies, it is intended as a transition from fundamental mathematics to the higher order skills used to solve the problems of Calculus.

## Introduction and prerequisites

Students taking precalculus will become familiar with the concept of functions and their graphs. They will learn to use the graphing calculator to represent and analyze mathematical models. It is assumed that students will prior knowledge of such algebraic concepts as:

- Arithmetic of fractions
- Order of operations and exponentiation
- Manipulation of algebraic expressions
- Linear relations and their graphs

## Course Objectives

Upon completion of this course, the student will be able to:

1. Sketch and analyze the graphs of common functions and relations.
2. Combine functions.
3. Understand direct, inverse, and combined variation.
4. Use mathematical models to solve problems.
5. Write and solve quadratic functions.
6. Use synthetic division to evaluate functions.
7. Obtain linear, quadratic, and cubic regression for observed data.
8. Compute compound and continuous interest.
9. Compute annuities:
  - a. Present value
  - b. Future value
10. Apply linear programming to marketing problems.

## Course outcomes

Emphasis in this course will be on the processes of analysis and problem solving. Students will learn to develop and make sense of mathematical models through:

- Curve sketching
- Operations on functions
- Use of graphing calculators

## Materials

Precalculus (7<sup>th</sup> edition), Demana, Waits, Foley, Kennedy

Graphing calculator:

**the instructor will use the TI-84 (overhead version) ...  
students may use one of the following:**

TI-82  
TI-83  
TI-84  
TI-86  
TI-89

## General

### Attendance

- Students are responsible for all material presented in class including announcements about course procedures. Tests, quizzes, and homework often include questions on material presented only in class, so performance on these reflects attendance.

### Evaluation

- Examinations: there will be two tests and a final examination. Tests will comprise 35%, and the exam 30%, of the final grade. Test dates will be announced in class at least one week in advance.
- Students should expect a quiz each session. These quizzes will comprise 20% of the final grade. Quizzes will reflect attendance so no provision will be made for makeup. The lowest quiz grade will be dropped at the end of the term **provided the student has perfect attendance.**
- In cases of **necessary absence**, additional assignments, quizzes, and tests may

be required.

- Another 15% of the final grade will be based on homework and attendance. This portion will be reduced by 2% for the first absence, an additional 2% for the second absence, and 1% for each absence after two.
- All tests and homework must be completed in order to complete the course, regardless of lateness. Unexcused late course work will lose 10% of point value for each week it is late. Arrangements for excused late work must be made in advance and approved by the instructor.
- **Bonus points:** many quizzes and tests will contain opportunities for bonus points. Students who have missed more than one class session will not be awarded any bonus points.
- Course grades will be assigned as follows:

|               |                            |                            |
|---------------|----------------------------|----------------------------|
| A: 96% - 100% | A <sup>-</sup> : 90% - 95% | B <sup>+</sup> : 87% - 89% |
| B: 83% - 86%  | B <sup>-</sup> : 80% - 82% | C <sup>+</sup> : 77% - 79% |
| C: 73% - 76%  | C <sup>-</sup> : 70% - 72% | D <sup>+</sup> : 67% - 69% |
| D: 63% - 66%  | D <sup>-</sup> : 60% - 62% | F : 0% - 59%               |

## Notes on homework

Selected exercises will be assigned from the textbook. Students are encouraged to work together and to complete all exercises on time. Assignments listed for each workshop will be discussed in class. Additional assignments will be collected for evaluation.

## Preassignment ( to be completed prior to first workshop )

1. Read chapter P: this is review, we will begin with Chapter One
2. Do the following ...
  - a. p. 66: 27 - 32
  - b. p. 67: 37 - 50 , 57 - 66
3. Make an ordered presentation of your work. **Do not show just answers.**

# WORKSHOP ONE

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## **Activities**

1. Introductions
2. Review of syllabus
3. Required materials
  - a. Graphing calculator (TI-83 or TI-84 preferred)
4. Solving equations in one variable (review of preassignment)
5. Getting to know the graphing calculator
  - a. scatterplots
  - b. graphing a function
  - c. maximum and minimum values
  - d. roots

## **Assignment to be completed prior to workshop two**

1. Read chapter one
2. p. 11: 12 - 32 even
3. pp. 20, 21: 30, 32, 34
4. p. 29: 11 - 25 odd  
35 - 45 odd

## WORKSHOP TWO

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### **Activities**

1. Questions and answers: Homework
2. Lines in the plane
3. Solving equations
  - a. Graphically
  - b. Numerically
  - c. Algebraically
4. Modeling

### **Assignment to be completed prior to workshop three**

1. p. 40: 15 – 25 odd
2. p. 42: 53
3. p. 50: 1 – 6 all, 29 – 34 all
5. p. 64: 17 – 25 odd
6. p. 82: 11 - 17 women
7. p. 83: 29 - 37 odd

## WORKSHOP THREE

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### Activities

1. Functions
  - a. Notation
  - b. Evaluation
  - c. Domain and range
2. Modeling with functions

### Assignment to be completed prior to workshop four

1. p. 102: 9 – 16 all  
41 - 45 odd
2. p. 160: 9 - 23 odd
3. p. 161: 30, 32, 36, 38, 40
6. p. 162: 49
7. p. 163: 50

## WORKSHOP FOUR

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### **Activities**

1. Test One
2. Linear and quadratic modeling
3. Power functions and modeling
4. Functions of higher order

### **Assignment to be completed prior to workshop five**

1. pp. 182, 183: 27 – 43 odd
2. pp. 183, 184: 49 – 55 odd
4. p. 184: 59, 64
5. pp. 196, 197: 7 – 25 odd
6. p. 198: 51, 53
7. p. 209: 17 – 23 odd
8. p. 210: 43 – 48 all

## WORKSHOP FIVE

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### **Activities**

#### **Mathematics of finance**

1. Interest
  - a. compound interest
  - b. annual percentage rate
2. Annuities
  - a. future value
  - b. present value

### **Assignment to be completed prior to workshop six**

1. pp. 341 - 342 1 – 55 odd

## WORKSHOP SIX

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### **Activities**

1. Systems of inequalities
2. Linear programming
  - a. Writing constraints
  - b. Graph and feasibility
  - c. Testing possible solutions

### **Assignment to be completed prior to workshop seven**

1. p. 623: 7 – 13 odd  
23, 25
2. p. 624: 31 – 40

## WORKSHOP SEVEN

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### **Activities**

1. Review test two
2. Finish linear programming
3. Discuss final exam review
4. (optional) Introductory probability
  - a. for bonus on exam

### **Assignment**

1. Prepare for final exam

## WORKSHOP EIGHT

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### **Activities**

1. Discussion and review. Unfinished exercises from workshop seven.
2. Course evaluation
3. Final examination