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The Syllabus

- The syllabus is located at www.ms.uky.edu/∼ma109/.
- It is a **contract** between you and your instructor.
- Read it.
- Reference it.
- You are responsible for everything in the syllabus even if your instructor does not remind you about its contents.
- Make a calendar for the school year. Include important dates, times, and locations.
- Cheating is described in the syllabus. Do not do it.

Reading Mathematics Textbooks

- Read your textbook **BEFORE** coming to class.
- Mathematics is read slowly.
- Take notes as you read.
  - Definitions.
  - Theorems.
  - Examples.
- Understand each step.
- If you have questions, make a note to ask them during class, recitation, or office hours.
- Read the textbook again **AFTER** lecture.

Homework

- Do your homework **EARLY**.
- Leave time to **Ask Questions**.
- Doing your homework is not enough to prepare you for exams.
- Online assignments.
- Online homework assignments will be due most Tuesdays and Fridays at 11:59pm.

College Vs. High School

College is different than high school. You need to:

- Study continually.
- **Regularly** Review.
- Learn both **CONCEPTS** and **PROCEDURES**.

How to Be Successful in College

- Know why each step in the solution is valid.
- If you do not understand a concept, ASK!
- If you still do not understand a concept, ASK AGAIN!
- **DO NOT Cram.**

Where can you go to find help?

- I hold office hours. Check the syllabus for times and locations.
- Your Undergraduate Assistant holds office hours. Check the syllabus for times and locations.
- The Mathskeller. Take an elevator to the basement of Patterson Office Tower. At the candy machines, turn left. Go down a very long hallway until you reach the red doors. Enter the red doors.

Concepts:

- Order of Operations
- Square roots and principal square roots.
- Negation.

(Section 1.1)

Order of Operations

In an expression without parentheses, exponents are performed first. Then multiplication and division are performed (from left to right). Addition and subtraction are performed last (from left to right).

Order of Operations

Example 1

Simplify the expression $-3^2 + 1$.

Order of Operations

If an expression contains parentheses,

- Do all computations inside the parentheses before doing any computations outside the parentheses.
- When dealing with parentheses within parentheses, begin with the innermost pair and work outward.

Order of Operations

Example 2

List the order in which operations are being applied to x.

$$2(x^3 - 5) + 1$$

Order of Operations

Example 3

List the order in which operations are being applied to a.

$$b^3 - 2a$$

Square Roots and Principal Square Roots

Definition 4

If $x^2 = y$, then x is **a square root of** y.

If $x^2 = y$ and x is **non-negative**, then x is **the principal square root of** y and we write $x = \sqrt{y}$.

Square Roots and Principal Square Roots

Example 5 (Square Roots)

All of the following are true.

(a) 3 is a square root of 9.

(b) -3 is a square root of 9.

(c) 3 is the principal square root of 9.

(d) $\sqrt{9} = 3$

Square Roots and Principal Square Roots

Example 6 (Do you understand square roots?)

What is $\sqrt{4}$?

(a) 2

(b) -2

(c) Both 2 and -2

(d) 16

(e) -16

(f) Both 16 and -16

Square Roots and Principal Square Roots

Property 7

$$\sqrt{ab} = \sqrt{a}\sqrt{b}$$

Square Roots and Principal Square Roots

Example 8 (Can you simplify square roots?)

Simplify.

1. $\sqrt{720}\sqrt{5}$

2. $\sqrt{1792} + \sqrt{7}$

Negation

If x is positive, then $-x$ is _____.

If x is negative, then $-x$ is _____.

The negative of $5 - x$ is _____.

The negative of $x - y$ equals _____.

Negation

Example 9 (Do you understand negative numbers?)

Which of the following is positive?

(a) $\pi - 2$

(b) $\sqrt{7} - 3$

Negation

Example 10 (Do you understand negation?)

Find the **exact** value.

(a) $-(\pi - 2)$

(b) $-(\sqrt{7} - 3)$