Exam 2 Review

Research has shown that students who develop their own study guides for exam preparation do better on their exams than students who use a study guide that has been developed for them. Thus, this is simply a topic list of the content we have covered in preparation for Exam 2. Hopefully you can use this topic list as a tool for developing your own study guide.

Concepts:

- Graphs of Functions

- Sketching Graphs of Functions

- Applying Transformations to the Graph of a Function

- How does a Graph Transformation Move a Point on a Graph?

(Section 3.4)

Concepts:

- Operations on Functions

- The Domain of a Composition of Functions.

(Section 3.5)

Concepts:

- The Definition of a One-to-one Function

- Graphs of One-to-one Functions (Vertical and Horizontal Line Tests)

- The Definition of an Inverse Function

- Inverse Function Notation

- Finding Formulas for Inverse Functions

- Evaluating Inverse Functions

- Graphs of Inverse Functions

- The Round-Trip Theorem

(Section 3.7)

Concepts:

- Quadratic Functions

  - The Definition of a Quadratic Function
  - Graphs of Quadratic Functions - Parabolas
  - Vertex & Absolute Maximum or Absolute Minimum
  - Trasforming the Graph of $f(x) = x^2$ to Graph Any Quadratic Function.

- Polynomial Functions

  - The Definition of a Polynomial - Identifying Polynomials
  - Leading Coefficient, Leading Term, Constant Term, and Degree of a Polynomial
  - Polynomial Division - The Division Algorithm
  - Roots and Zeros of a Polynomial
  - The Remainder Theorem & The Factor Theorem
  - The Number of Roots of a Polynomial

(Sections 4.1-4.2)

Concepts:

- Graphs of Polynomials

  - Leading Term vs. Shape of the Graph
  - Continuous Graphs
  - Smooth Graphs
  - End Behavior of the Graph
  - Multiplicity of a Root and Behavior of the Graph at x-intercepts
  - How Many Local Extrema Can a Polynomial Graph Have?

(Sections 4.4)

Concepts:

- The Definition of a Rational Function

- Identifying Rational Functions

- Finding the Domain of a Rational Function

- The Big-Little Principle

- The Graphs of Rational Functions

- Vertical, Horizontal, and Oblique Asymptotes

- Holes in the Graphs of Rational Functions

(Section 4.5)

Concepts:

- Equivalent Inequalities

- Solving Polynomial and Rational Inequalities Algebraically

- Approximating Solutions to Inequalities Graphically

(Section 4.6)

Concepts:

- The imaginary number i.

- Complex numbers.

- Complex arithmetic.

- Solutions to quadratic equations.

- Applications.

(Section 4.7)

Concepts:

- The nth root.

- Rational and Irrational Exponents.

- Radicals.

- Applications.

(Section 5.1)

Concepts:

- Exponential Functions

    - Power Functions vs. Exponential Functions
    - The Definition of an Exponential Function
    - Graphing Exponential Functions
    - Exponential Growth and Exponential Decay

- The Irrational Number e and Continuously Compounded Interest

- Applications

(Section 5.2)

Concepts:

- Logarithms

    - Logarithms as Functions
    - Logarithms as Exponent Pickers
    - Inverse Relationship between Logarithmic and Exponential Functions.
    - The Common Logarithm & The Natural Logarithm
        * Definition and Graphs
        * Exponential Notation vs. Logarithmic Notation
        * Evaluating Common & Natural Logarithms
    - Logarithms with Different Bases
        * Definition and Graphs
        * Exponential Notation vs. Logarithmic Notation
        * Evaluating Logarithms with Different Bases

(Section 5.3)