AP Calculus Outline

Chapter 1 and Review

Items in Red will be on the test

Review

Define the following and understand the concepts surrounding and connecting the following terms:

Function, Domain, Range, (as defined on page 10), independent variable, dependent variable, graph (as defined on p.11)

1. Representations of Function (p. 12-15)
   1. Verbally – by a description in words
      1. **Vocabulary** (some new some old): Exact, approximate**, increasing/ decreasing** (p. 19 see below), concave up, concave down, positive, negative, **rate of change** \*(see note below).
   2. Numerically – by a table of values
   3. **Visually – by a graph**
   4. **Algebraically – by an explicit formula**
   5. **\*NOTE:** A big Idea in Calculus with describing a function and/or graph is discussing its growth rate. We might discuss it over time, over a period of time/interval, or at an instant.
2. **Piecewise Defined Functions (p. 17 – 18)**
   1. **What is it?**
   2. How to put it into your calculator.
3. **Symmetry (p. 17 – 18)**
   1. **Even function**
   2. **Odd function**
4. **Increasing vs. Decreasing function (p. 19)**
   1. **What does it mean for a function to be increasing or decreasing?**
   2. **Notation Example: *The function g(x) increases on the intervals***
5. Types of functions. 1.2 will define these in general terms. For each type of function listed below, sketch a Visual of the function, write down what we might be able to see or look for in a table (Numerically), how can you describe it Verbally, what if the equation of the function in general form (Algebraically).
   1. Linear
      1. Verbally
      2. Numerically (what pattern do we see in the table)
      3. Visually
      4. Algebraically
   2. **Polynomials**
      1. Verbally
      2. Numerically
      3. **Visually – Graph and Graphing Calculators**
      4. **Algebraically**
         1. **Be able to factor them.**
         2. **What does the leading coefficient tell us about what the graph looks like?**
   3. Power
      1. How does the graph change for different values of ?
   4. **Rational** 
      1. **Asymptotes**
      2. **Holes**
      3. **How to recognize zeros from the equation**
      4. **Finding y intercepts**
   5. Algebraic
      1. Define and how is it similar/different from a Rational Function
   6. Trigonometric
      1. Verbally
      2. Numerically (what x values do we use/care about in trig functions)
      3. Visually
         1. Oscillation
      4. Algebraically
   7. Exponential (1.5)
      1. Verbally
      2. Numerically (What pattern do we see with the outputs in the table?)
      3. Visually
      4. Algebraically
      5. Laws of Exponents
      6. The number *e*.
      7. Applications in nature and society
   8. Logarithmic
      1. It an inverse of what type of function?
      2. Asymptotes?
6. **New Functions from Old Functions (1.3)**
   1. **Transforming Functions**
      1. **Dilation and how are these different**
      2. **Translations what makes it move left or right?**
      3. **Shift**
      4. **Reflection**
   2. **Adding, Subtracting, Multiplying, Dividing Functions**
      1. **[Note this is**
      2. **For all of the above if A is the domain of and B is the domain of , then the domain of each of the new functions above is?**
   3. **Composing Functions** 
      1. **Use a table to compose a function.**
      2. **Identify what g(x) is in the composition of functions**
7. Graphing Calculators and Computers (1.4)
   1. Just a lesson on being careful. Take notes on whatever useful tips or tricks you learn during class discussion. Feel free to share any tips you know about graphers to help us “see” important characteristics about our functions.
8. **Inverse Functions** and Logarithms (1.6)
   1. *One to One* Functions
      1. Horizontal Line test
   2. **If is a one to one function with domain A and range B, then its inverse function has a domain B and a range B.**
      1. **Be able to find the inverse of a function both graphically and algebraically.**
   3. Logarithmic Function
      1. Functions denoted by that are inverses of exponential functions
   4. Laws of Logs
   5. Ln
   6. Change of Base Formula
   7. Arcsine, arccosine, arctangent (domains)