Topic #7: Formal Definitions (Math 31)

1. Goals:
   a. Formal Definition of Limit
   b. Calculating Limits from the formal definition
2. Some pre-algebra:
   a. Ex: Add and divide rational expressions
3. Informal Definition.
   a. Recall definition of f'(x) = the slope of the tangent line at x of the function f
   b. Show animation from book web link page 215.
   c. Draw f' from f: Discuss some values and + or – before graphing.
4. Formal Definition
   a. Give visual way of finding tangent line as limit of secant lines.
   b. DO: With string and volunteers and make table of h vs. slope values.
      i. Need:
         1. Point Person
         2. 2 Line People
         3. An Eye
         4. Data Collector
      ii. Do in groups on board; I draw
   c. TWO definitions by limit (See picture page 216)
5. Calculate derivatives using formal definition
   a. Examples [DO: First with numbers for x; then just x; find some eqns of tan lines]
      i. For any line (use both definitions)
      ii. Ex: x^2 and with coefficients.
      iii. Derivative of 3/x
      iv. $(x^3 - x)$