MATH 111 REVIEW FOR EXAM I

If you haven’t already, read through your lecture notes and the Supplementary Reading. There is a lot of really good stuff in the Supplement: great pictures and useful summaries, in particular. Use your notes and the Supplement to put your sheet of notes together and organize your thoughts.

Remember that the key to success is to do a lot of problems. Re-do homework, activities, test prep problems and do as many old exams as you have time for in a test-like setting.

You should expect questions about all of the following:

• rates of change in various contexts
  – overall and incremental rates of change
    * There are good summaries with definitions on pages 1 and 10 of the Supplement.
    * All of the homework problems from Sections 1–5 deal with this material.
  – graphical interpretations
    * There are summaries on pages 5 and 10 of the Supplement.
    * Most of the homework from Sections 1–5 deal with this material.
  – backwards questions
    Sections 1 and 2 of the Supplement deal only with forward questions in which you are given the graph of distance, given a time or an interval, and asked for the associated rates of change. Section 3 deals with backwards questions in which you are instead given the graph of distance, given a rate of change and asked to find the associated time or interval. Section 4 contains both types of questions in different contexts. It is particularly important that you practice these types of questions and learn to understand why your methods work.
  – super-backwards questions
    In several homework problems, you are given the graph of a rate of change. With these questions, it is important that you learn how to read the graphs properly and apply the correct definitions and formulas to answer questions about the situation. Again, the only way to learn this material is to practice. These questions contain no new material—all the definitions you need are in the summaries from Sections 1–4. You should make sure you understand how to do these homework problems:
    * Supplement 1–3 #2
    * Supplement 4 #1, 3
    * Activity 1 #2
– translating between three languages
  * This material is covered in Section 5 of the Supplement.
  * There is a summary on page 12 of the Supplement.
  * You should complete the chart that we did in lecture (answers posted on with the Lecture Notes from Section 5).
  * In order to do well on this exam, you must know the basic vocabulary of this class in all three languages. You may be asked explicitly to translate between the three languages. Moreover, even if you are not asked explicitly to translate, being able to answer most questions requires that you read a question in English, translate to one of the other languages (graphical or functional), do a computation, and translate your result back into English. Don’t skimp on this stuff!

• revenue, cost, and profit
  – definitions and graphical interpretations
    * This material is covered in Sections 6–9 of the Supplement.
    * You should know all definitions, graphical interpretations, and formulas listed in the summaries on pages 17 and 38.
    * You should be able to answer forward and backwards questions here, too.
  – special considerations about marginal revenue and marginal cost
    * Section 7 of the Supplement covers marginal revenue and marginal cost in detail.
    * The definitions of marginal revenue and marginal cost are difficult to give concisely. You should understand why and be able to define them and use them in any situation. Pay particular attention to the units in your situation (read Section 7.3).
    * You should have a firm grasp on what the relationship between marginal revenue and marginal cost tells you about profit (read Section 7.4).
    * There is a summary on page 24 of the Supplement but you should be able to fill in what’s missing there (i.e., what are the “appropriate adjustments” that need to be made?).
  – analysis of cost
    * Sections 8 and 9 cover analysis of cost graphs.
    * You should know the definitions and graphical interpretations of average cost, average variable cost, breakeven price, and shutdown price if you are given the graphs of TC and/or VC.
    * You should know how to find breakeven and shutdown price given either the graphs of total and variable cost OR given the graphs of marginal, average, and average variable costs. (See the summaries on pages 30, 31, and 38.)
    * You should be able to deal with super-backwards problems: given the graphs of MC, AC, AVC, and MR, answer questions about TR, TC, and profit (like Supplement 8–9 #3).
• linear equations and functions

- This is the material from Harshbarger/Reynolds, Sections 1.1–1.3, and 1.6.
- You should be able to:
  * solve linear equations and inequalities
  * set up linear functions, equations, and inequalities from a verbal description
  * do applications in the context of linear total revenue, total cost, and profit
    and in the context of supply and demand