Study Guide for Exam CH 5 with 4.2, 4.3

The best way to prepare for this exam is to do lots of problems. Your MML site has a revciew problem set and a practice exam and you can work these as many times as you like. You should work until you can do all problems easily. The practice exam has more problems (30) than the real thing (20).

Be sure to review the material in the handbook as well, especially the Property of Inverses exercises (p. 121), exponential modeling problems (p. 134), the exponential decay HW exercises (p. 142), the basic logarithm exercises (pp. 144 – 146), and the properties of logarithms (pp. 157-158). Remember to review also the handout on exponential growth. The handbook contains many worked examples for these topics.

Here are the main topics in each section of the textbook:

Section 4.2 Combining Functions, composite functions

- Be sure you can add, subtract, multiply, divide functions and find the domains of each (like #1 – 10 on p. 271)
- Find the composition of two functions, (like #11 – 20, 21 on pp. 271- 272) THIS IS THE MOST IMPORTANT SKILL IN THIS SECTION. You might redo the MLP homework in this section as well.
- You may be asked to do a word problem, like #25 – 30 on pp. 272-273. Be sure you can find the profit function given revenue and cost and also find the maximum revenue.

Section 4.3 Inverse Functions pp. 284 - # 3, 5, 7, 9, 15, 19, 23, 24, 25, 26, 32

- Be able to verify that two functions are inverses of each other, like p. 121 in the Handbook
- Given a graph of a function, be able to sketch the graph of its inverse
- Determine if a function is one to one.
- Given a one to one function, find its inverse
- Interpret inputs and outputs of the inverse of a given function

Section 5.4 Exponential and Logarithmic models pp. 365 -368: #1, 2, 5, 9, 17, 19, 21, 23

- Be able to write an exponential growth or decay model given a real world situation with initial value, and growth or decay rate or factor (like the handout and p. 142 in the handbook). The MML HW 5.4 exercises are also good.
- Given a table of values, be able to write an exponential model WITHOUT USE OF THE GRAPHING CALCULATOR, like those on p. 134 in the handbook.
- Know the two formulas for compound interest: $A = P\left(1 + \frac{r}{n}\right)^{nt}$ and $A = Pe^{rt}$ and be able to use them to find future values, given Principle, rate, and number of compoundings, or continuous compounding.

Section 5.1 Exponential Functions and their graphs: pp. 321 - :#7, 9, 11, 15, 29, 33, 35, 43

- Be able to graph a basic exponential function by hand
- Be able to name the properties of exponential functions and their graphs (domain, range, asymptote, y-intercept)
- Given an exponential function modeling a real world situation, be able to find and interpret function values.

Section 5.2 Logarithmic functions; Properites of Logarithms

- Evaluate basic logarithms, like those on pp. 144- 146 in the handbook
- Use properties of logarithms to write a log expression as a sum or difference of logs. MLP HW 5.2B has good practice problems, as does p. 157 in the handbook
- Use properties of logarithms to write an expanded expression as a single log. MLP HW 5.2B has good practice problems, as do pp. 156 and 158 in the handbook

Section 5.3 Exponential and Logarithmic Equations

- Be able to solve an exponential equation line # 1 – 10, 15-21 on p. 350 in the textbook. (These problems are like the MML HW 5.3). Remember, the steps are:
    1) Isolate the exponential term by dividing through by the initial value
    2) Take the log or ln of both sides
    3) Bring the exponent down front using a property of logarithms
    4) Solve for the variable
- Be able to solve a logarithmic equation like #23 – 36 in the text book. (These problems are like the MLP HW 5.3). The technique is :
    1) Use the properties of logarithms to obtain a single log on one side
    2) Use the definition of logarithm to write the log equation in exponential form
    3) Solve for the variable
- Be able to solve exponential equations in context. Most of these applications will involve the base *e.* After dividing through by the initial value, take the ln of both sides. pp. 351-352: 41, 47, 48, 48, 48, 55