Newberger, College Algebra 112-10, Spring 2005

Final Exam Review sheet The final exam will be in two parts. The first part will be cumulative, covering material from prior exams. The second part will cover the new material from Chapter 5 on logs and exponential functions.

Part I: Cumulative Part

For this part, your best resource is the old exams. If you can do the problems on the midterms, you are likely to be able to do the problems on the final.

A. From Exam 1: Lines and inequalities.
   (a) You will be asked to graph a lines and systems of inequalities (shading the appropriate regions in the plane).
   (b) You may be asked to determine the formula of a line give its graph. You may be asked to determine the system of inequalities that describes a given region.
   (c) You will be asked to find where two lines intersect, and to find the x-intercept of a line (which is the same as finding where the line intersects the line $y = 0$.)

B. From Exam 1: Word problems and modelling.
   (a) You will be asked to identify ratios in word problems, and create functions of one and two variables from word problems using ratios.
   (b) You will be asked to evaluate functions at specific values, and to explain what evaluated functions represent verbally. For example, the function $A(l, w) = lw$ models the area of a rectangle with side length l and width w. This function $A(l, w)$ evaluated at the point $(2, 4)$ is $A(2, 4) = 2 * 4 = 8$. Verbally $A(2, 4)$ represents the area of a rectangle with length 2 and width 4.
   (c) You will be asked to solve a linear programming word problem that involves maximizing profit or minimizing costs.

C. From Exam 2: Matrices.
   (a) You will be asked to convert a system of equations into an augmented matrix and solve if possible. You may be asked if the system is consistent or inconsistent. Practice problems with unique solutions, page 526, #15-24. Practice problems with no solution or infinitely many solutions, page 526 #25-34. Mixed problems page 527 #35-46.
   (b) You will be asked to use matrices in an application. See Example 7 page 534, and practice problems #49-52 on page 538.

D. From Exam 3: Functions and their graphs.
   (a) You will be asked to evaluate a function at a given number (for example given a formula for $f(x)$, be able to find $f(5)$ (by plugging 5 in for x))(see problems #25-34 in Section 3.1). Know what the domain of a function is and how to determine it from the formula (See problems 35-56 page 221).
   (b) You will be asked to get information off of a graph, including the domain and range of the function and its values (for example, given the graph, be able to find $f(a)$ for a given number a).
   (c) You will be asked to modify a formula in order to transform the graph by shifting up, down, left or right or by reflecting across the x- or y-axes. You will be given a modification of a formula and asked how it changes the graph (see problems #1-10 page 255, and #18,19 page 256). You will be given a graph of a function and asked to draw the graph of a modified version of that function (see problems #19,20 page 257). You may be asked to do these things with logs and exponential functions as well as with x^2, x^3, $\sqrt{x}$, $\sqrt[3]{x}$, and $1/x$.

Part II. New Material

A. **Sections 5.1 and 5.2** Know the graphs of exponential functions and log functions as shown on page 386 and 402. Be able to find the formula for an exponential function or a log function given the graph and the coordinates of a point on the graph. See page 392, #9-18 and page 406, #35-44. Understand the definition of the log function, and be able to use it to calculate, as in the exercises at the end of Section 5.2.

B. **Section 5.3 and 5.4** Know the third law of logs, and be able to use it to solve exponential equations. See Examples 1,2,3 page 417 and Exercises #1-26 on page 424.

C. **Section 5.5** You may be asked to write down the formula for the model for exponential growth given on page 428. Make sure you know what each variable in the formula stands for. You will be asked to use the model for exponential growth to answer word problems, such as found in Example 1,2,3,4 and 5 pages 429-430, and Exercises 1-13 on page 438.