Study Guide for Test 2

I have listed a range of possible practice problems for each of the main concepts covered on the test. I'd suggest looking at the worked out examples in the textbook (I've provided page numbers), and trying a few practice problems (there are a lot) for each concept. Focus on the odd-numbered problems, so you can check your answers against the solutions given in the back of the book. Note that the following is just a list of the material covered in class. Not all of it will be covered on the exam, but all of it is fair game.

Key concepts

For this test, you should know how to do the following :

1. Identify intervals on which a function is increasing or decreasing
   Read: pg 173-174
   Practice problems: Sec 2.3 #s 1-4

2. Find the average rate of change of a function between two points
   Read: pg 175-178
   Practice problems: Sec 2.3 #s 13-25

3. Understand how various transformations of a function affect its graph. In particular, understand vertical shifts, horizontal shifts, vertical stretching/shrinking, horizontal stretching/shrinking, and reflections over the vertical and horizontal axes.
   Read: sec 2.4 examples 1-8
   Practice problems: Sec 2.4 #s 1-10, 17-20, 23-26

4. Determine whether a given function is even, odd, or neither, both algebraically and by looking at a graph (Don't confuse even and odd functions with even and odd degreed polynomials! these are totally separate concepts!)
   Read: sec 2.4 example 9
   Practice problems: Sec 2.4 #s 61-68

5. Put a quadratic function into standard form, and find the coordinates of the vertex (i.e., the maximum or minimum)
   Read: Sec 2.5 Examples 1-4
   Practice problems: 1-38

6. Use your calculator to find the maxima and minima of a given function
   Read: Sec 2.5 Examples 5-9
   Practice problems: 47-58

7. Set up and use mathematical models of a single variable
   Read: Sec 2.6 - all
   Practice problems: Sec 2.6, #s 1-6, 13, 15, 16, 20-26

8. Find sums, differences, products and quotients of 2 or more functions, and find the resulting domains.
   Read: Sec 2.7 - Examples 1, 2
   Practice problems: Sec 2.7, #s 1-10

8. Compose of 2 or more functions, and find the domain of the composition, when the functions are expressed as equations, tables, or graphs.

Read: Sec 2.7 - Examples 3-6, the composition worksheet done in class

Practice problems: Sec 2.7, #s 1-10

9. Understand the definition of a one-to-one function, determine whether a given function is one-to-one or not, and understand that a function has an inverse if and only if it is one-to-one.

Read: Sec 2.8 Example 1-3

Practice problems: sec 2.8 #s 1-16, 55-60

10. Find the inverse of a function and identify the domain of the inverse (understand the relationship between the domain and range of a function, and the domain and range of its inverse).

Read: Sec 2.8 Examples 4-7

Practice problems: Sec 2.8 #s 17-54

11. Express the meaning of an inverse in an application proble

Practice problems: Sec 2.8 #s 71-79

12. Find the end behavior of the graph of a polynomial function by looking at the equation.

Read: Pg 252-254

Practice problems: Sec 3.1 5-10, 37-42

13. Find the zeros of a polynomial, understand the relationship between the graph of a polynomial and its zeros.

Read: Pg 254-261

Practice problems: Sec 3.1 11-46

14. Construct a polynomial with a given set of zeros.

Read: Sec 3.2 example 6

Practice problems: Sec 3.2 3s 57-66

15. Find the quotient and remainder of dividing one polynomial by another using polynomial long division and, when appropriate, synthetic division.

Read: Sec 3.2 Examples 1-3

Practice problems: Sec. 3.2 #s 1-36

16. For a given rational function, find the x- and y-intercepts (if they exist), all asymptotes (vertical, horizontal, slant) if they exist, and sketch a graph of the function. Understand the requirements for a rational function to have a horizontal asymptote (see blue box on pg 305).

Read: Sec 3.6 Examples 1-8

Practice problems: Sec 3.6 #s 5-64