Math 122 (Section 1) **Exam 3 Review Sheet**

Chapter 2

2.4 In this section you are asked to give the practical meaning of statements such as $f(8) = 100$ and $f'(8) = 4$. Knowing the units for f and f' makes this easier to do. You should also be able to approximate $f(9)$, $f(8.1)$, $f(7.3)$, etc. Look at #1,2,8,10,11,12,15,17 from section 2.4. Also look at quiz #7.

2.5 Graph a function which is increasing (or decreasing) at an increasing, decreasing, or constant rate. Look at a graph or table of values for $f(x)$ and answer questions about f, f' or f''. If the graph of f is concave up (or down) on an interval, then know what this tells you about f' or f'' on that interval. Look at #1,2,3,4,5,8,15,16 from 2.5. Also look at quiz #8.

2.6 Given a cost function and a revenue function, be able to compute marginal cost, marginal revenue, and profit. Know the connection between maximum profit and these marginal quantities. Know the practical meaning of these marginal quantities. Look at #1,2,3,6,9,10,11,12,13 from section 2.6. Also look at quiz #9.

Chapter 3

3.1 Given a graph, formula, or table of values for the rate of change of some quantity, use Riemann sums (left sums and right sums) to approximate the total change in that quantity. If the graph for this rate of change is always increasing or if it is always decreasing, then you should be able to determine whether your approximation is an underestimate or overestimate to the exact total change. Averaging the left sum and right sum will usually give you a better approximation. Look at #3,4,5,6,7,8,9 from section 3.1.

3.2 Given a definite integral, be able to approximate its value using Riemann sums. If you have a formula for the integrand, then you should also be able to quickly obtain very good approximations using your calculator's built-in integrator. Look at #1,2,3,4,5,6,7,8,12,13,14,15,16,17,18,20 from section 3.2.

3.3 Set up (and possibly evaluate) the definite integral (or integrals) needed to compute an area between two curves (one of these curves may just be the x-axis). Given a graph of a function, be able to approximate (or find exactly if you see the area of basic shapes like triangles or rectangles) a definite integral of that function. Remember that the definite integral of a function gives the "signed area" between the graph of that function and the x-axis. Look at #1,2,3,7,9,10,11,12,15,16,17,18,23 from section 3.3.

3.4 Given the rate at which some quantity is changing, be able to set up the definite integral which gives you the exact total change in that quantity. If the rate of change was given as a formula, then use the calculator's built-in integrator to evaluate the definite integral. If the rate of change was given as a graph, then use areas to approximate the definite integral. Look at #4,5,7,8,10,18 from section 3.4.

3.5 The **Fundamental Theorem of Calculus** can be stated in either of the following two ways:

- The definite integral of the rate of change of some quantity gives us the total change in that quantity.
- $\displaystyle\int_a^b F'(t)\,dt = F(b) - F(a)$

Be able to state and use the Fundamental Theorem in each of these ways. Look at #1,2,3,5,6,10 from section 3.5.