Functions

1. Use four ways of representing a function: verbal description, table (numerical data), graph, formula.
2. Recognize linear and exponential functions from a table and write formulas for them.

   Review Problem: p 81, #41

Rates of change and derivative functions

1. Interpret the derivative as a rate of change
2. Use a local linear approximation to estimate values of a function near a given point
3. By looking at the graph of a function determine the points where the first and second derivatives are positive/negative/zero.
4. Using the graph of a function, estimate the derivative at a point
5. Compute derivatives symbolically, using the product, quotient, and chain rules

   Review Problems: p 121 # 5, 20, p 122 # 25, 28, 35

Net change, integrals, and antiderivative functions

1. Estimate net change from a graph of the rate of change
2. Estimate the net change from a table of the rate of change
3. Evaluate indefinite integrals using antiderivative formulas and the technique of substitution
4. Evaluate definite integrals using the fundamental theorem of calculus

   Review Problems: p 264 # 2, 20, 25, 26, p 322 # 13, 19, 21, 24, 32, 34, p 312 # 22-25

Applications of the derivative and partial derivatives

1. Locate critical points, local max/min points, inflection points from the graph of the derivative
2. Compute first and second order partial derivatives
3. Find local max/min points for functions of two variables using the second derivative test
4. From a contour diagram, determine the signs of partial derivatives, locate critical points, local and global max/mins

   Review Problems: p 223 #13, p 389 #1, p 380 # 5, 6, 11

Differential equations

1. Write a differential equation from verbal description
2. Estimate a solution numerically
3. Solve a differential equation of type $y' = ky$.
4. Sketch solution curves from a slope field, estimate equilibrium solutions, determine stability

   Review Problems: p 441# 4, 5, p 442 #9

Time and location: Wed Dec 7, 1-3pm, in our usual classroom

Extra office hours: Tues 10am-4pm, Wed 10am-1pm

Cheat Sheet: You may use a cheat sheet as long as you make it yourself.

- two sides of a standard (8.5×11) sheet of paper
- with your name on it
- will be collected with your exam.

You might want to include formulas for derivatives and antiderivatives. I would recommend including the statement of the second derivative test for functions of two variables.