Outcomes List for Math 122_200802:  
Winter 2008-09

Updated for Exam 2

The following information is for reviewing for the material of Exam 2.

The material for Exam 2 is from sections 7.1, 7.2, 7.7, 8.2

7.1 Find the area between the graphs of two functions over an interval of interest. Find the area enclosed by two graphs which intersect.

In addition to reviewing assigned problems from 7.1, look at (all references to section 7.1):

Examples 2, 4, and 5; Regular Problems 3, 4, 14, 18

7.2 Find the volume of a figure of known cross-sectional areas. Find the volume of the solid of revolution the graph of a function over an interval of interest, rotated about a given axis. Find the volume of the solid between two such rotated graphs.

In addition to reviewing assigned problems from 7.2, look at (all references to section 7.2):

Examples 4, 5; Quick Check Problem 1,4; Regular Problems 6, 36

7.7 Define work as an integral. Relate work to gravitational force (weight) and altitude. Calculate work done in different physical circumstances - by a varying force as a function of position in an interval; by constant forces acting over different distances in an extended body. Under certain circumstances, it is useful to set up a Riemann sum for the problem, which will tell you the relevant integral for the problem.

In addition to reviewing assigned problems from 7.7, look at (all references to section 7.7):

Examples 3, 5; Regular Problems 14, 16.

8.2 State the rule for integrating functions by parts. By practice, you should be able to quickly make the assignment of \( f \) and \( g' \) (or \( u \) and \( dv \)). Be able to do repeated integration by parts, to reduce the problem to a simpler, doable one.
In addition to reviewing assigned problems from 7.2, look at (all references to section 7.2):

Examples 4,6; Quick Check Problem 3; Regular Problems 7, 12, 39

The preceding information is for reviewing for the material of Exam 2.

The following information is for reviewing for the material of Exam 1.

Chapter 6: The Integral. In this chapter we define the integral of a function and view it in several contexts: as the inverse of differentiation, as the area under a curve, and as an accumulation of changes in a quantity. We develop a set of techniques for integrating common functions.

6.2 Relate integration and differentiation as operations on functions. Given a differentiation rule, construct the associated indefinite integration rule. Quickly integrate powers, polynomials, exponentials, and basic trig functions.

In addition to reviewing assigned problems from 6.2, look at (all references to section 6.2):

Quick check problem 2; Regular problems 2b, 6, 10, 36.

6.3 Simplify a complicated integral to a known form by substitution of variables.

In addition to reviewing assigned problems from 6.3, look at (all references to section 6.3):

Examples 11, 12; Quick check problem 3; Regular problems 18, 24, 26

6.4 Understand and evaluate the summation notation.

State the Sigma notation operation's basic properties and some useful summations and limits of summations. Approximate the area under a curve as such a sum. Find the net signed area under a curve as a limit of such approximations. Find the total area under the curve, and explain the difference.

In addition to reviewing assigned problems from 6.4, look at (all references to section 6.4):
Examples 2, 3, 5; Quick Check Problems 2, 3; Regular Problems 28, 29.

6.5 Given a function over an interval, construct the associated Riemann sum. Evaluate the definite integral of an integrable function over a given interval. Explain the geometric meaning of this quantity. Explain what it means for a function to be integrable, or not. Describe some useful properties of the definite integral.

In addition to reviewing assigned problems from 6.5, look at (all references to section 6.5):

Examples 1, 2; Quick Check Problems 2, 3; Regular Problems 6, 10, 30, 32

6.6 Relate definite and indefinite integrals. State the Fundamental Theorem of Calculus. Use this theorem to calculate areas under curves by integration. State the Mean-Value Theorem for integrals and discuss its meaning in terms of averaging. Track accumulation of changes in a system via integration.

In addition to reviewing assigned problems from 6.6, look at (all references to section 6.6):

Examples 3, 7, 8, 10, Regular Problems 18, 30, 56

6.8 Explain the effect of substitution of variables (from 6.3) on definite integration. Evaluate definite integrals using this technique.

In addition to reviewing assigned problems from 6.8, look at (all references to section 6.8):

Examples 3a, 3b; Quick Check Problem 2; Regular Problems 4, 10, 22, 36

The preceding information is for reviewing for the material of Exam 1.