

### Topics for Exam 3 Math 31, Spring 2010

**General information.** Exam 3 will be a timed test of 70 minutes, covering 7.8, 8.3, and 11.1–11.5 of the text. Most of the exam will be based on the homework assigned for those sections. If you can do all of that homework, and you know and understand all of the ideas behind it, you should be in good shape.

You are allowed to use a calculator and notes on **ONE**  $3 \times 5$  note card (both sides).

As mentioned above, your first priority should be to understand the homework and quizzes and the ideas behind them. Besides the list of things you should know, below, you should also be familiar with everything specially emphasized in the text. If time permits, try to do some of the problems that have answers in the back of the book.

**Section 7.8.** Improper integrals. Infinite limits of integration: definition, how to calculate, what convergent and divergent mean. Discontinuous integrands: definition, how to calculate, what convergent and divergent mean. Comparison test.

**Section 8.3.** Idea of center of mass. Computation of the mass of a 2-D region. Computation of the center of mass/centroid of a 2-D region.

**Section 11.1.** Definition of sequence; notation  $a_n$ ,  $\{a_n\}$ , etc. Going from formula to list of first few terms, or vice-versa. Limit of a sequence (idea only); limit laws (pp. 704–705). Relative sizes of: constant  $\ll \ln n \ll n^t \ll a^n \ll n!$ .

**Section 11.2.** Definitions: Infinite series, sequence of partial sums. Definition of what it means for an infinite series to converge/diverge, and what the sum of a convergent series is. Special cases: Geometric series; harmonic series.  $n$ th term test for divergence. Sum and constant multiple rules for series (p. 719).

**Section 11.3.** Idea of integral test; how integral test works. Example:  $p$ -series.

**Section 11.4.** The Comparison Test. The Limit Comparison test. Examples.

**Section 11.5.** Definition of alternating series. The Alternating Series Test.

**Not on exam.** (8.3) Hydrostatic pressure and force. (11.1) Formal definition of the limit of a sequence; pp. 682–684. (11.3) Estimating the sum of a series. (11.4) Estimating the sum of a series. (11.5) Estimating the sum of a series.