

**Math 2934 — Summer 2015**  
**Review for second exam**

The second exam will be on sections 14.1, 14.3, 14.4, 14.5, 14.6, 14.7, 15.1, and 15.2 of the text. This material was covered on Assignments 5 through 8.

**14.1. Functions of several variables.** You can safely skip most of this section, except that you should read the material on pages 907 through 911 on level curves and level surfaces.

(Note: Section 14.2 is not covered in this course. Although the notions of limit and continuity are important for a more advanced understanding of calculus, gaining mastery of these notions requires more time than we have in this course. Introductory calculus texts usually only give a cursory discussion which would not be enough for full understanding anyway. If you want to learn more about limits and continuity, a good source would be a text on real analysis, like R. G. Bartle's *Introduction to Real Analysis*.)

**14.3. Partial derivatives.** You can skip the first couple of pages of this section and start reading on page 926. Read from there through Example 7 on page 932. You can skip the material after Example 7 on pages 932 – 935.

**14.4. Tangent planes and linear approximations.** We covered the whole section except that we skipped Definition 7 and Theorem 8; you can skip those, if you want, when reviewing this section.

You should understand the meaning of Figure 7 clearly. Especially note the relation between the vertical distances  $dz$  and  $\Delta z$ .

**14.5. The Chain Rule.** You can review the whole section, except you don't need to worry about the proof of the Chain Rule on pages 948–949.

**14.6. Directional derivatives and the gradient vector.** You should review this entire section.

**14.7. Maximum and minimum values.** You can review from the beginning of the section through Example 5. (You don't need to read the subsection on “Absolute maximum and minimum values” on pages 975–977.)

You don't need to memorize the Second Derivative Test in the read box on page 971. It's possible that I'll ask a question on the exam like Example 3 on page 971, or like the homework problems I assigned from this section; but if I do, I'll provide you with the statement of the Second Derivative Test on the exam along with the question.

**15.1. Double integrals over rectangles.** Double integrals are actually limits of Riemann sums. We did not emphasize this fact in class yet, but it is the right way to think of a double integral, and will be useful later. So you should read pages 998 – 1001 of this section for basic background knowledge.

**15.2. Iterated integrals.** Review the entire section.