

Math 1914 Review for Final Exam

The final exam is comprehensive; it will cover all the material that was covered on the three midterm exams, plus the material in sections 4.5, 5.1, 5.2, and 5.3 of the text (see Assignments 14 and 15, and Quiz 7).

Section 3.7, Optimization Problems, will not be covered on the final after all. I realized this weekend that, through an oversight on my part, I never did assign any problems from this section for homework. We did do several problems from this section in class, including the problems of whether a pole could be carried around a corner, and what dimensions a Norman window should have to let in the most light. But since we haven't had as much practice on this type of problem as I would have liked, I decided not to put them on the final. They are nice problems, though! We will see them again in upcoming semesters of calculus.

Also, though there won't be story problems involving maxima and minima on the final, there will be problems like those in sections 3.1 through 3.5, in which you have to find the maximum or minimum values of a given function. Also, there will be story problems on other topics, such as a related-rates problem like the ones in section 2.8.

You can use the review sheets for the first, second and third exams to guide your review of the material we covered up through over section 4.4 on the test. Below are a couple of comments on what definitions and proofs might be asked on the final, and on the sections covered on the final that weren't covered on the first three exams.

You should know the following definitions: definition of continuity (see first review sheet), definition of derivative (see first review sheet), and definition of definite integral (see third review sheet). I won't ask you to write down the precise definition of limit, but I might ask a problem like the one I did in class Friday in which you're asked to use the precise definition of limit to prove a limit statement (see, for example, problem 5 on the first exam). Also, I might ask you to prove the product rule for derivatives on the exam (see first review sheet).

4.5. The substitution rule. Of all the calculus techniques you've learned this semester, integration by substitution is the one you'll use most frequently in any future math classes you might take. You should carefully review this entire section.

5.1. Areas between curves. Review the entire section, but you can skip Examples 3 and 4.

5.2. Volumes. Review the entire section. The basic formula is the formula for the volume of a solid as an integral of cross-sectional areas, in the red box on page 453. If the solid is a solid of revolution, then its cross sections will be discs or washers, and you should use the formulas for the areas of discs or washers given at the bottom of page 357. It's important to do a number of different examples or exercises to get a feel for how to use these formulas.

5.3. Volumes by cylindrical shells. Review the entire section.