Review Sheet for Exam 1

Standard disclaimer: The following represents a sincere effort to help you prepare for our exam. It is not guaranteed to be perfect. There might well be minor errors or (especially) omissions. These will not, however, absolve you of the responsibility to be fully prepared for the exam. If you suspect a problem with this review sheet, please bring it to my attention (bounty points are possible).

Review: I will use my office hours on Wed Feb 25 to answer questions and review for the exam.

Time and place: the exam will take place Thursday, Feb 25 in class.

Ground Rules: the exam is closed book and no calculators are allowed. All you'll need are sharp pencils and a good eraser. No pens please!

Format: Similar to fall exams, probably less emphasis on true/false questions. The exam will cover the inverse and implicit function theorems (Shifrin 4.5 and chapter 6), determinants (Shifrin 7.5) and integration (Shifrin Chapter 7). As usual, the versions of definitions, theorems, etc that appear in my own notes will be definitive for the exam. My notes on integration largely take the place of Shifrin 7.1.

Some Specific Things:

Examples: You should certainly have in mind an example of a bounded function on a rectangle that is not Riemann Integrable. You should also know an example of a continuous function that is not uniformly continuous.

Definitions: The only definitions I will ask about are the ones in my notes numbered 2.1, 3.2, 4.1, and 5.3.

You don't need to know: the most general statement (Theorem 1.6 in my notes) of the implicit function theorem. I will not ask you to state Fubini's Theorem or the cofactor expansion theorem.

Proofs: I'd like you to know the proof that a continuous function on a rectangle is Riemann integrable. Not sure I'll ask for it, but I might.

Computational things: I'm much more interested in the setup of integrals than the actual evaluation of them, so I won't try to trip you up by forcing you to do e.g. elaborate tricks with trig substitutions, partial fractions or integration by parts. Concerning change of variables problems, it's probably a good idea to just memorize the change of variables factors associated to polar, cylindrical and spherical coordinate systems.