Some Exam 1 Information, Math 112Z, Horn

The first exam is coming up on Monday, September 28th. Below is some important information to remember:

- A sample exam will be posted on the class website (by Monday).
- You will be allowed a single handwritten $8\frac{1}{2} \times 11$ sheet of notes on the exam.
- No calculators will be allowed (or necessary) for the exam.
- I expect that you know u-substitution, and some basic integrals: eg. integrals of $x^p, \sin(x), \cos(x)$ and $\int \frac{1}{1+x^2} dx = \arctan(x)$.
- I do *not* expect that you know integration by parts, partial fractions, trig substitution or other bizarre formulas. There is no need to copy the integration tables for weird formulas onto your crib sheet; for instance, if I wanted you to find $\int \frac{1}{u^2-1} du$ as part of a problem, I would give you the formula $\int \frac{1}{u^2-1} du = \frac{1}{2} \ln \left| \frac{u+1}{u-1} \right| + C$. Likewise for odd things like $\int \sec(u) du = \ln|\sec(u) + \tan(u)| + C$ (even though, technically, this is just a clever substitution. Try and see if you can derive it - Hint: multiply $\sec(u)$ by $\frac{\sec(u)+\tan(u)}{\sec(u)+\tan(u)}$).
- There will be a mix of more computational questions (eg. Does ... converge, what is the sum of ...) and conceptual questions (eg. Give an example of a sequence which has property ... or the True/False section - see below)
- If in doubt: *Ask* or write it down on your note sheet - better to be safe than sorry!
- Expect True-False questions; but for these prepare to defend your answer by either explaining why it's true (or citing a result from the book), or giving an example of how it's false.
  - Example: TRUE or FALSE: If $\lim_{n\to\infty} a_n = 0$, then $\sum_{i=0}^{\infty} a_i$ converges.
    CORRECT ANSWER: This is FALSE. Consider $\sum_{n=1}^{\infty} \frac{1}{n}$. This is the harmonic series, which diverges, and $\lim_{n\to\infty} \frac{1}{n} = 0$.
  - Example: TRUE or FALSE: If $\lim_{n\to\infty} a_n \neq 0$, then $\sum_{i=0}^{\infty} a_i$ diverges.
    CORRECT ANSWER: This is TRUE; this is the 'No Way Test' or divergence theorem.
- Exam will cover through 12.1-12.3, 7.2*-7.3*, and 8.8. It is possible there will be a (fairly easy) 12.4 question if we cover enough of it, but I expect this will wait for the next exam. I will warn you if I feel we've done enough.
- We will spend next Friday reviewing (bring questions!) and I will hold extra office hours towards the end of the week.