QTips: Tips for Exam 1

0) The quizzes were very easy. The exam will be harder. Ish.

1) For your cheat sheet: you’ll need to have derivatives and integrals of trig functions: sine, cosine, tan, sec. You’ll need basic trig identities like \( \cos^2 x + \sin^2 x = 1 \) and \( \sec^2 x = 1 + \tan^2 x \). You’ll need recursions, so copy those. You’ll need trig sub. Trig sub sometimes needs right triangles, so know that. You’ll need to know sinh or cosh for the ODE part of the exam.

2) This section is called ‘techniques’ so you’re being tested whether you know techniques we did in class. Getting an answer using alternative methods might cost you points; if you’re not sure, ask by email.

3) One example: say you are asked to do

\[
\int \frac{\sec x}{\tan x} \, dx
\]

The technique you’ve been taught is to convert this into sines and cosines. You have to do this!

4) Another example: say you’ve got this far:

\[
\int \sin^2 x \cos^2 x \, dx = \int \sin^2 x \, dx - \int \sin^4 x \, dx
\]

Now you’ll use recursions. You’ve been taught to do recursions on \( \int \sin^4 x \, dx \) first, and then combine that result with \( \int \sin^2 x \, dx \), and finally do the recursion on \( \int \sin^2 x \, dx \). You have to do that.

5) For the second order ODE, I said in class that there are things you have to do. You will lose points if you don’t do them. If you don’t know, look at the 14u problems – they all say what you have to do.