

Math 212 Quiz #3 review sheet of goodness

By: The Klein 4 Group

November 22, 2006



Hello, fellow math lovers. This is the Klein 4 group here to tell you about your upcoming quiz. We're a group of students at Northwestern University (or at least we were in 2005) and sing awesome a capella songs about math. We don't have one currently about your upcoming quiz, but instead we put our heads together and made this review sheet. Enjoy, and ROCK ON!

1. Section 8.3: Trigonometric Integrals. In this section you'll be asked how to integrate products of sin and cos, and products of sec and tan. It is up to you how to go about doing these integrals, but unless its the product of even powers of sin and cos, you'll use some sort of u -substitution.
2. Section 8.4: Trigonometric Substitution. This is clearly Corey's favorite section. Here, you'll be integrating functions that have a difference or sum of squares. There is a clever guide to what sort of substitution to make on page 543, or hopefully also in your notes. Just remember, all you have to do is make the substitution and follow your nose. After integrating, you'll have to go back and back substitute (for indefinite integrals) or just plug in numbers (for definite integrals... remember that many times it's easier to go ahead and compute the bounds in terms of θ rather than back substituting and plugging in x).
3. Section 8.5: Partial Fractions. In this section we learn how to integrate almost any kind of reasonable rational function by way of decomposing the polynomial in the denominator into a product of irreducible factors and expressing the fraction you're given into a sum of two (or more) fractions involving simpler polynomials

which, hopefully, we can integrate. It is essential that you know the possible kinds of decompositions of polynomials up to degree 3 in the denominator and be able to carry out this distillation process effectively. The best study suggestion I can give you is to just practice every different type of problem you see until you're comfortable with the process.

4. A list of formulae you'll be provided with: There are several formulae that I mentioned will be provided for you. Here they are:

$$\begin{aligned}1 &= \sin^2 \theta + \cos^2 \theta \\ \sec^2 \theta &= \tan^2 \theta + 1 \\ \csc^2 \theta &= 1 + \cot^2 \theta \\ \cos(2\theta) &= \cos^2 \theta - \sin^2 \theta \\ \sin(2\theta) &= 2 \sin \theta \cos \theta\end{aligned}$$

5. ROCK ON.