Mathematics 112 Outline for Quiz 3 Winter 2009

This quiz covers everything done in class on January 19, 21, and 23, and the types of homework problems assigned on those days.

Reminder: The quiz is on Wednesday January 28. There will be an optional review session Tuesday January 27 at 1pm in Bailey 207.

• Integration by substitution
  
  A. Basic substitution for powers
    
    – Five step procedure for integrating by substitution
      (1) Choose \( u \).
      (2) Compute \( du \).
      (3) Substitute \( u, du \) into the integral.
      (4) Antidifferentiate.
      (5) Convert the answer back to the original variable.
    
    – Rule of thumb: in an integral with an expression raised to a power, try letting \( u \) equal the thing raised to a power (even if the power is \(-1\))
  
  B. Other substitutions
    
    – General Principle: try the substitution \( u = g(x) \) when you see both \( g(x) \) and \( g'(x) \) as part of the integral.
    
    – Specific rules of thumb: try \( u = g(x) \) for integrals involving \( [g(x)]^r \) or \( e^{g(x)} \) or a trig function like \( \sin(g(x)) \) or \( \sec^2(g(x)) \).