MATH 3B

MIDTERM 2 STUDY GUIDE

This is a study aid. It is meant to help increase your chances of success on the second midterm. Unlike the last study guide, this list IS comprehensive. Expect no surprises. I do not expect you to work every problem here, however working and understanding a sufficient sampling of these problems will GREATLY improve your chances of doing well on the midterm.

(1) **Areas between curves:** Section 6.1 #1-30
(2) **Volume of solids of revolution using disk or washer method:** Section 6.2 #1-30
(3) **Volume of solids of revolution using cylindrical shell method:** Section 6.3 #3-26
(4) **Various methods of integration:**
  (a) Integration by Parts Section 7.1 #3-38
  (b) Trigonometric Integrals Section 7.2 #1-49
  (c) Trigonometric Substitution Section 7.3 #1-30
(5) **Additional Remarks:**
  (a) It goes without saying that you will be expected to know how to do the "regular" u-substitution problems.
  (b) It also goes without saying that you will be expected to know the antiderivatives that you should have already memorized (e.g. the antiderivatives of $\sin x$, $\cos x$, $\sec^2 x$, $\csc^2 x$, etc.)
  (c) Be prepared to know sine and cosine of the "special angles": $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}$. This information may be helpful in solving definite trigonometric and trigonometric substitution integrals.
  (d) Remember that I am providing the following formulas on the exam:
   (i) $\sin A \cos B = \dfrac{1}{2}[\sin(A-B) + \sin(A+B)]$

   In particular, this implies that $\sin A \cos A = \dfrac{1}{2}\sin(2A)$
   (ii) $\sin A \sin B = \dfrac{1}{2}[\cos(A-B) - \cos(A+B)]$

   In particular, this implies that $\sin^2(A) = \dfrac{1}{2}[1 - \cos(2A)]$
   (iii) $\cos A \cos B = \dfrac{1}{2}[\cos(A-B) + \cos(A+B)]$

   In particular, this implies that $\cos^2(A) = \dfrac{1}{2}[1 + \cos(2A)]$