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