MATH 252 HW #4: CHAPTER 17

FALL 2008

Write your name and class and clearly separate sections! See the syllabus.
Show work where appropriate, and use "good form and procedure," as in class!
(The solutions manual may have insufficient work.)
This is due when you take Quiz 4.
Graded out of 10 points.
"*" denotes "See Hint below."
Read some of the Examples in this chapter for additional assistance.

(My notes are also fair game for tests.)

17.1: 13, 17, 19, 21, 31, 45, 47, 49

Look at 11: Gives you an idea of how to do a Calculus III version of a Riemann sum approximation.

17.2: 1, 17, 19, 23-31 odd (don't sketch the solid in 23-31)

17.3: 1, 13, 15, 19, 23, 25

17.4: 1, 3, 5 (Use the Table of Integrals on p.A21), 9, 13

Challenge Problem #1 (Optional): A plane intersects the *xy*-plane in an acute angle θ. Consider the part of the plane (a "sticky," maybe?) whose projection (shadow) onto the *xy*-plane is a rectangle with dimensions Δx and Δy. Prove that the surface area of the sticky is $(\sec\theta)(\Delta x)(\Delta y)$. What happens when $\theta = 0$? $\theta = \frac{\pi}{2}$?

Challenge Problem #2 (Optional): Use the method of Section 17.4 to find the surface area of a sphere of radius ρ. Warning: You're going to deal with an improper integral! Note: The method from Section 6.5 is easier, because a sphere is a surface of revolution.

THERE IS MORE!

17.5: 1, 3, 5, 13*, 15*, 17*, 19*, 29, 31

Note: On 13-19, you do not have to sketch the solid.

17.6: 1, 9, 17, 25

17.7: 1-29 odd, 31a, 34 (Answer: $\frac{128}{3}k\pi$), 39

17.8: 1-11 odd, 21, 23, 27, 31, 37*, 39

Note on 37: The answer in the back of the book is wrong! The correct answer is: $\frac{4}{5}\left(4\sqrt{2}-1\right)k\pi$

Look at 40, 41.

Look at Example 5 on p.946. If you're up to the challenge, try #35. Where do the cone and the sphere intersect? Try to set up an appropriate triple integral, and also look for an easier solution!

17.9: 9, 13, 17, 19, 21, 23, 29*, 33

Hint on 29: You don't have to use the Fundamental Theorem of Calculus!

Look at 35, 36.