MATH 252 HW #2: CHAPTER 15, 16.1, 16.2

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 2.
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.)
Mark vectors as in class; don't use "boldface" for vectors.

15.1: 19*, 21, 23

Hint on 19: Use the Table of Integrals on p.A21.

15.2: 1, 3, 11*, 17, 19, 21, 26, 27, 29, 31, 33, 47, 48

Hint on 11: My online notes on Section 13.1 may help.

Look at 39, 40, 42.

15.3: 9, 11, 13, 15, 17

Think About It: How does the curve determined by $\mathbf{r}(t) = \left\langle \cos\left(t^2\right), \sin\left(t^2\right), t^2 \right\rangle$ and the motion along it differ from similar examples we have done in class?

Physics students should read this section with its many applications. Angular velocity and projectiles (including gravity) are key topics.

CONTINUED ON THE BACK!

15.4: 1a, 3a (assume $t > 0$), 5a, 7, 19, 21a

Additional Problem: Prove that the binormal vector $\mathbf{B}(t)$ is always a unit vector. (Assume that **r** and **T** are everywhere differentiable, and their derivatives are never **0**.)

Look at 44-47.

Look at the comments before 49. It's often difficult to find arc length parametrizations!

15.5: 3 (curvature only), 11*, 16, 17

(Most of the relevant notes are in my notes for Section 15.4.)

Note on 11: There's an easier solution compared to what's in the solutions manual. Why does this result make sense?

16.1: 1, 3, 5, 7-13 odd (just describe the graph; don't graph), 15, 16, 17, 18 (also do $k = 0$), 19, 20, 21, 37-42 all

Additional Problem: Describe the graph of $f(x, y) = x^2 + 6x + y^2$.
Hint: Do some basic algebra first!

Review Section 14.6 on Quadric Surfaces.

Read the examples in the book.

Look at 49.

16.2: 1, 5, 9, 11, 21, 23