Spring, 2006

Physics 263: BTM Problem Set #11

As Shankar says at the end of the first two sections of this chapter, he (and I) assume the problems in this set won't be new to you, but a reminder. Please be sure to read the text; although the discussion in the first two sections is probably quite familiar, we'll be generalizing the concepts as we move on to linear vector spaces in Chapter 9. Please ask questions! The problems are due by 5:30pm in the box in 1011 on Monday, May 8 (delayed until Monday because of midterm and Smith lecture).

1. **BTM Problem 7.1.1.** Working through the proof of the simplest transformation of vector components between coordinate systems related by a rotation.

2. **BTM Problem 7.2.2.** This problem and the next one are just checks and review of familiar concepts. However, please get used to carrying them out in terms of the unit basis vectors $\widehat{\mathbf{i}}$, $\widehat{\mathbf{j}}$, and $\widehat{\mathbf{k}}$.

3. **BTM Problem 7.2.3.** Again, do this in terms of the unit basis vectors $\widehat{\mathbf{i}}$, $\widehat{\mathbf{j}}$, and $\widehat{\mathbf{k}}$, using $\widehat{\mathbf{i}} \times \widehat{\mathbf{j}} = \widehat{\mathbf{k}}$, and so on.

4. **BTM Problem 7.2.4.** A reminder of velocity and acceleration in polar coordinates (as in 261 and 262).

5. **BONUS: BTM Problem 7.1.3.** Triple product as a volume.