

Review for Second Exam

The second exam will cover sections 14.1 through 16.3 of the text, not including section 15.8. We didn't cover all of the material in these sections, though. Here is a more detailed list of the portions of the text that were covered in class.

- 14.1** We covered all of this section except for the final subsection, "Using Computers to Draw Space Curves".
- 14.2** We covered all of this section except for the final subsection on "Integrals" (p. 896).
- 14.3** We covered all of this section except for the final subsection on "The Normal and Binormal Vectors".
- 14.4** Here is all you need to know from this section for the exam:
 - (1) If a particle moves so that its position at time t is given by the position vector $\mathbf{r}(t)$, then the particle has velocity $\mathbf{r}'(t)$, speed $|\mathbf{r}'(t)|$, and acceleration $\mathbf{r}''(t)$.
 - (2) You should be able to explain why \mathbf{T}' is perpendicular to \mathbf{T} (it is explained in Example 5 of Section 14.2).
 - (3) If we start from the equation $\mathbf{r}'(t) = s\mathbf{T}$, where s stands for the speed, and differentiate with respect to time, we get

$$\mathbf{r}''(t) = \frac{ds}{dt}\mathbf{T} + s\mathbf{T}'(t).$$

This expresses the acceleration \mathbf{r}'' as the sum of two vectors, the first of which is tangent to the path followed by the particle and the second of which is perpendicular to the path followed by the particle.

- 15.1** This section is mostly discursive; I would just recommend that you be sure you read the subsections on "Level Curves" and "Functions of Three or More Variables" (pp. 928–933).
- 15.2** You can skip this section entirely.
- 15.3** We covered this section from the beginning up to Clairaut's theorem (p. 952); you can skip the rest.
- 15.4** We covered the entire section.
- 15.5** We covered the entire section.
- 15.6** We covered the entire section.
- 15.7** Read from the beginning through Example 3.
- 16.1** Read from the beginning to the bottom of p. 1019.
- 16.2** Read the entire section.
- 16.3** Read from the beginning through Example 5.