Math 135 - Winter 2000

Homework to be done by March 2nd

Section 12.4: Problems 5, 7, 9, 11, 15, 17, 30, 31, 32, 39, 43, 50.
Section 12.5: Problems 3, 7, 13, 19, 21, 23, 35, 37, 40.
Section 12.6: Problems 3, 5, 7, 9, 26.

In connection with Section 12.6, you might want to look at Sections 9.6 and 9.7, the first place in the book where parameterized curves are introduced. There will be more about this next week.

Problems to be handed in on March 2nd

Problem 1 Show that for any vectors $\mathbf{a}$ and $\mathbf{b}$,

$$\bigl| \, \|\mathbf{a}\| - \|\mathbf{b}\| \, \bigr| \leq \|\mathbf{a} - \mathbf{b}\|.$$

(Hint: $\mathbf{a} = (\mathbf{a} - \mathbf{b}) + \mathbf{b}$.)

Problem 2.

2.1 Suppose $\mathbf{a} \cdot \mathbf{b} = 0$ and $\mathbf{a} \times \mathbf{b} = \mathbf{0}$. Show that either $\mathbf{a} = \mathbf{0}$ or $\mathbf{b} = \mathbf{0}$.
2.2 Now suppose $\mathbf{a} \neq \mathbf{0}$. Show that if $\mathbf{c}$ and $\mathbf{d}$ are vectors such that $\mathbf{a} \cdot \mathbf{c} = \mathbf{a} \cdot \mathbf{d}$ and $\mathbf{a} \times \mathbf{c} = \mathbf{a} \times \mathbf{d}$, then $\mathbf{c} = \mathbf{d}$. (Use the result of part (a).)