Math 313 **Homework 2** **Due Fri., Feb. 13, 2004**

There are two kinds of homework problems: ungraded and graded. Ungraded problems have answers in the back of the book. Subject to unimportant numerical changes, one or two of them will show up on each test. Graded problems don't have answers in the back of the book. Some of the graded problems will come with a symbol such as ($\mathcal{E}$), meaning that it is an old exam question. Hopefully, this homework is less *unusual* than the first.

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1. – (ungraded) §3.6 – 2. (That is, there are 13 of one suit, followed by 13 of another suit, etc.)

2. – (ungraded) §3.6 – 14.

3. – (ungraded) §3.6 – 16.

4. – §3.6 – 8.

5. – §3.6 – 24.

6. – §3.6 – 31.

7. – §3.6 – 35 (First distribute the lemon and lime drinks .)

8. ($\mathcal{E}$) How many ways are there to arrange the letters A,L,T,G,E,L,D,H,A,L,L so that the A's are not consecutive?

9. ($\mathcal{E}$) How many ways can 7 professors and 5 students be seated at this long table so that no student sits across from another student? Assume people are distinct.

10. Find an integer n with the property that, if n points $P_i = (a_i, b_i, c_i)$ are given in $\mathbf{R}^3$, then there must exist $j < k < \ell$ so that the triples (a_j, a_k, a_ℓ), (b_j, b_k, b_ℓ) and (c_j, c_k, c_ℓ) are *each* monotone (either monotone non-increasing or monotone non-decreasing), although they might be monotone in different directions. It is not required that you show that n is best possible.