Math 24
Assignment 1
Due Monday 7 January 2002

Reading: Read Appendix C (pp. 510–513) and section 1.1 and 1.2 of the text. Come to class with questions and comments on Monday!

Written assignment: work problems #1, 10, 13, 18 and 22 of section 1.2 in the text. In addition, work the following problems.

1. In no more than a page, write a summary of why induction is a valid method of proof. Assume your audience is someone with little or no mathematical sophistication.

2. Use mathematical induction to prove that

$$1^2 + 2^2 + 3^2 + \cdots + n^2 = \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}.$$

3. Use mathematical induction to prove that if $x \geq 0$ and $n \in \mathbf{N} = \{\, 1, 2, 3, \ldots \}$, then $(1+x)^n \geq 1 + nx$.