CSE 321: Discrete Structures
Assignment #3
October 15, 2004
Due: Friday, October 22

Reading Assignment: Read Sections 1.6 - 1.8, 2.4, and 2.5.

Problems:

1. Section 1.5, exercise 20.
2. Section 1.5, exercise 26.
3. Section 1.5, exercise 28.
4. Prove that for all integers n, n^2 always leaves a remainder of 0 or 1 when divided by 4.
5. Section 1.5, exercise 74.
6. Prove or disprove that $n^2 + 3n + 1$ is always prime for integer $n > 0$.
7. Prove the following statements using the definitions of set operations and properties:
   - $(A \cap B = A) \rightarrow (A \subseteq B)$
   - $(A \subseteq B) \leftrightarrow (\bar{B} \subseteq \bar{A})$
8. **Extra Credit:** Prove that any prime number larger than 3 leaves a remainder of 1 or 5 when divided by 6.