CSE 321: Discrete Structures
January 29, 2007

Assignment #4
Due: Monday, February 5

Problems:

1. Section 4.1, exercise 10 [5th edition: Section 3.3, exercise 6]
2. Section 4.1, exercise 30 [5th edition: Section 3.3, exercise 58]
3. Prove that 3 divides $n^3 + 2n$ whenever n is a positive integer.
4. Section 4.1, exercise 66 [5th edition: nonexistent, see scan on web page]
5. Section 4.2, exercise 10 [5th edition: Section 3.3, exercise 34]
6. Section 4.2, exercise 12 [5th edition: nonexistent, see scan on web page]
7. Section 4.3, exercise 16 [5th edition: Section 3.4, exercise 16]
8. If Σ is an alphabet, for $x \in \Sigma^*$ we define the *reversal* of x recursively as follows:

   - **Basis:** $\lambda^R = \lambda$ where λ is the empty string
   - **Recursive step:** $(ua)^R = au^R$ for $a \in \Sigma, u \in \Sigma^*$

   Show using structural induction on $x \in \Sigma^*$ that if $w, x \in \Sigma^*$ are two strings in Σ^* then

   $$(wx)^R = x^R w^R$$