Math 312, Section 102 Homework #7

due Tuesday, November 6, 2001 at the beginning of class

- I. Rosen, Section 5.5, p. 195, #12 and #16
- II. While copying the ISBN for a book, two adjacent digits were accidentally transposed (though no other errors were made). If the incorrect ISBN is 0-471-62564-9, what is the correct ISBN?
- III. Prove that if any two different digits from a valid ISBN are exchanged, the resulting string of digits will not satisfy the ISBN mod-11 congruence.
- IV. Find the missing digit in each of the following UPC codes.
 - (a) 0 34138 207?0 4
 - (b) 4 002?3 10101 7
- V. Find the last three digits of each of the following Hamming code strings.
 - (a) 0101???
 - (b) 1110???
- VI. In each of the following Hamming code strings, either no errors or one error has been made. Decide which ones are correct, and in the incorrect ones, find and fix the error that was made.
 - (a) 1001011
 - (b) 1010101
 - (c) 1111111
 - (d) 0110010
- VII. Rosen, Section 6.1, p. 203, #8 and #14. Hint for #8: $1,763 = 41 \times 43$. (Since $1,763 = 42^2 1 = (42 1)(42 + 1)$, I'm sure you would have found this easily!) Use Wilson's Theorem and the Chinese Remainder Theorem.