Homework 4
due October 29, 2003

1. Rosen 3.5 #4 (a)-(c), pg. 117
Using the Fermat factorization method, factor each of the following positive integers: 8051, 73, 46009.

2. Rosen 3.5 #20, pg. 118
Find all primes of the form $2^{2^n} + 5$, where n is a nonnegative integer.

3. Rosen 3.5 #24, pg. 119
Factoring kn by the Fermat factorization method, where k is a small integer, is sometimes easier than factoring n by this method. Show that it is easier to factor $3 \cdot 901$ than to factor 901.

4. Rosen 3.6 #9, pg. 124
Find all integer solutions of each of the following linear diophantine equations:

$$(a) \quad 2x + 3y + 4z = 5$$
$$(b) \quad 7x + 21y + 35z = 8$$
$$(c) \quad 101x + 102y + 103z = 1.$$

5. Rosen 3.6 #14, pg. 124
A piggy bank contains 24 coins, all of which are nickels, dimes, or quarters. If the total value of the coins is two dollars, what combinations of coins are possible?

6. Rosen 3.6 #20, pg. 125
The post office of Davis is left with stamps of only two values. They discover that there are exactly 33 postage amounts that cannot be made up using these stamps, including 46 cents. What are the values of the remaining stamps?