

# Finite Math, Math 220, Summer 2006

## Friday Group Work

Assigned: Friday, August 11, 2006  
Due: Tuesday, August 15, 2006

### 1 Anagrams

Find all 4-digit positive integers that satisfy

$$4 \cdot abcd = dcba$$

where  $a, b, c, d$  are digits in the decimal expansion.

### 2 1's, 2's, and 3's

Consider the equalities

$$11 = 2 + 3^2$$

$$1111 = 22 + (33)^2$$

$$111111 = 222 + (333)^2$$

Make a conjecture about the pattern and prove it.

### 3 A Pattern of Primes?

How many primes are there that when written in their decimal expansions are alternating 1's and 0's, beginning and ending with 1? For example:

Is 101 prime?

Is 10101 prime?

Is 1010101 prime?

And so on.

It might be helpful to use problem 2 above.