MA202:004 Problem set 4

January 28, 1999

Announcements: 1. Below are a few problems regarding divisibility and factoring numbers. 2. Next Tuesday, I will collect notebooks and look at problems from sets 2 and 3. 3. By the end of this set, you should have finished rereading Chapter 4.

1. Carry out the sieve of Eratosthenes to find the primes up to 144. Explain what you have done.
2. Section 4.1, #26. You should give an explanation which shows you have found all the solutions.
3. If today is Wednesday, what day of the week will it be in 7^{950} days? What day will it be in 6^{950} days? What about 2^{333} days?

   Hint: As you are working on this problem, you might want to consider what day of the week it will be in 6^2, 6^4 days and so on.
4. Consider the Fibonacci sequence $1, 1, 2, 3, 5, \ldots, F_n, \ldots$ where F_n is defined to be $F_n = F_{n-1} + F_{n-2}$. Which of the Fibonacci numbers, F_n, are even?
5. If we take two consecutive Fibonacci numbers, F_{n-1} and F_n, what is their greatest common divisor, $GCD(F_{n-1}, F_n)$?