115 Homework 2

Due Friday October 15

Question 1 Find primes that are the difference of cubes of two integers. Can you place conditions on such pairs of integers?

Question 2 (Rosen 3.1.4) Find all primes less than 200 using Erastosthenes' sieve.

Question 3 (Rosen 3.1.6) Show that no integer of the form $n^3 + 1$ is prime other than $2 = 1^3 + 1$.

Question 4 (Rosen 3.1.12) Find:

- The smallest 5 consecutive composite integers.
- 1,000,000 consecutive composite integers.

Question 5 (Rosen 3.1.20) What is the least positive integer x such that $x^2 - x + 41$ is composite?

Question 6 (Rosen 3.2.8) Show that if integers a and b obey $(a, b) = 1$, then $(a + b, a - b) = 1$ or 2.