Math 301 Assignment 5

These problems are due in class on Tuesday. If your homework takes up multiple pages, they must be stapled together. Your work must be legible, and any frills from notebook paper must be removed.

Book Exercises

Section 4.1: # 36, 38, 40 (For #40, use the fact that for any integer k, $k^2 + k$ is even)
Section 4.2: # 2, 4
Section 4.3: # 4, 14, 24, 26, 32abcd, 40abcdef (you can use matrices for #40)
Section 4.4: # 6, 10, 12

Additional Exercises

#1. Compute the following (I took these numbers from #2 in Section 4.2. Use the repeated squares method we discussed in class. There is an example that uses a similar algorithm on p. 254 of the book.)

   a. 17^{321} mod 41

   b. 61^{1023} mod 70

   c. 5^{100632} mod 11

#2. Three positive integers a, b, c form a *Pythagorean Triple* if $a^2 + b^2 = c^2$. Prove that there is no Pythagorean Triple a, b, c in which both a and b are odd (Hint: Consider some of the facts you proved in section 4.1)

Practice Problems

Section 4.1: # 35, 37, 39
Section 4.2: # 1, 3, 25, 27
Section 4.3: # 3, 5, 13, 15, 25, 27, 33, 39
Section 4.4: # 5, 9, 11