MA261 – Homework #6

Due Monday, October 14, in class

I'm going to jump ahead, so begin reading Chapter 2. Focus on the definitions, and 2.1–2.2, 2.5, 2.7–2.11 to start.

1. (a) Prove Theorem 1.51: Let a, b, c, x_0, and y_0 be integers with a and b not both 0 such that $ax_0 + by_0 = c$. Then the integers

$$x = x_0 + \frac{b}{(a,b)} \text{ and } y = y_0 - \frac{a}{(a,b)}$$

   also satisfy the linear Diophantine equation $ax + by = c$.

   (b) Illustrate this theorem with a particular choice of values for the integers.

2. (a) Prove Theorem 1.55: If a and b are integers, not both 0, and k is a natural number, then $\gcd(ka, kb) = k \cdot \gcd(a, b)$.

   (b) Illustrate this theorem with a particular choice of values for the integers.

3. Exercise 2.5. In particular, be sure to answer the final question.