MATH 2601 - FoMP - Homework 2

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Due: **Friday (in class), September 7, 2018**

Problem 1. Let c be a common divisor of positive integers a and b. Let $g = GCD(a,b)$. Show that $c|g$. *Hint.* Use the property that g can be written as an integer combination of a and b.

Problem 2. Here is another way to prove that there are infinitely many primes. Suppose there are only finitely many, and that $p_1, p_2, \ldots, p_k$ are all of them. Then *consider* the integer

$$M = \frac{\prod_{i=1}^{k} p_i}{p_1} + \frac{\prod_{i=1}^{k} p_i}{p_2} + \cdots + \frac{\prod_{i=1}^{k} p_i}{p_k} \ .$$

Complete the proof.

Problem 3. Find integer solutions to the equation $990x + 84y = 24$, using the (extended) GCD algorithm.

Additionally, turn in the following problems from Hammack's book.

1.4: 6, 18	2.5: 10
1.8: 4, 8, 14	2.6: 6, 10

Optional Problems (No need to submit).

1.1: 52	2.3: 2, 6, 10, 12
1.3: 2, 10, 14	2.6: 12, 14
1.4: 14, 16, 20	