Assignments will not be collected for grading.

Readings

Read sections 11.6 of *Schaum’s Outline of Discrete Mathematics*.
Read section 6.6 (Don’t worry if the theorems of this section seem daunting. The first 3 pages of the section do give a good explanation of gcd, and lcm.) of *Discrete Mathematics Elementary and Beyond*.

Problems

(1) Let $a, b \in \mathbb{R}$. Prove $(ab)^n = a^n b^n$, for all $n \in \mathbb{N}$. Hint: Use induction on the exponent $n$.

(2) Let $a = 1763$, and $b = 42$
   (a) Find $\text{gcd}(a, b)$. Show the steps used by Euclid’s algorithm to find $\text{gcd}(a, b)$.
   (b) Find integers $x, y$ such that $\text{gcd}(a, b) = ax + by$
   (c) Find $\text{lcm}(a, b)$

(3) Prove $\text{gcd}(a, a + k)$ divides $k$.

(4) If $a$ and $b$ are relatively prime, that is $\text{gcd}(a, b) = 1$ then we can always find integers $x, y$ such that $1 = ax + by$. This fact will be useful to prove the following proposition.

   Suppose $p$ is a prime such that $p|ab$, that is $p$ divides the product $ab$, then $p|a$ or $p|b$. 