MATH 113: DISCRETE STRUCTURES
HOMEWORK FOR WEDNESDAY WEEK 11

Problem 1. Prove that if p is prime, a and b are integers, and $p \mid ab$, then either $p \mid a$ or $p \mid b$ (or both).

Problem 2. Let p be a prime and let a be an integer $1 \leq a \leq p - 1$. Consider the numbers $a, 2a, 3a, \ldots, (p-1)a$. Divide each by p to get remainders $r_1, r_2, r_3, \ldots, r_{p-1}$. Prove that every integer from 1 to $p - 1$ occurs exactly once among the remainders. (*Hint*: First prove that no residues can occur twice.)