

MATH 113: DISCRETE STRUCTURES
HOMEWORK 29

Problem 1. Let r be the remainder when you divide b by a . Assume that $c \mid a$ and $c \mid b$. Prove that $c \mid r$.

Problem 2. The book's proof does a fine job of guaranteeing that prime factorizations of integers are unique, but it elides the proof that prime factorizations *exist*. Give an inductive proof that every integer $n \geq 2$ has a prime factorization. (You will want to use "strong induction": after establishing the base case, assume that every positive integer less than or equal to n has a factorization into primes.)