

Homework 15 (the last one)

Math 300, Fall 2022

This homework is due on WEDNESDAY, December 7.

0. (*This problem is not to be turned in.*) Read Sections 6.4–6.5
 - (a) Section 6.3 #7, 12
 - (b) Section 6.4 #5, 11
1. Prove or disprove: *For $a, b, c \in \mathbb{Z}$, if $\gcd(a, c) = 1$, then $\gcd(ab, c) = 1$.*
2. Prove or disprove: *For $a, b, c \in \mathbb{Z}$, $\gcd(b, c) = \gcd(a, c) = 1$ if and only if $\gcd(ab, c) = 1$.*
3. Prove that, for all positive integers m , congruence modulo m is an equivalence relation (on the set of all integers).
4. Write the addition and multiplication tables for \mathbb{Z}_{10} .
5. Section 6.3 #4, 5
6. Section 6.4 #2, 8
7. Section 6.5 #4