



INTRODUCTION TO ABSTRACT MATHEMATICS
FALL 2013

ASSIGNMENT 8.3
DUE NOVEMBER 1

Exercise 1. Define a relation \sim on \mathbb{R} by declaring that $x \sim y$ if and only if $x - y \in \mathbb{Z}$. Is \sim an equivalence relation?

Exercise 2. Define a relation \sim on \mathbb{Z} by declaring that $m \sim n$ if and only if $|m - n| \leq 1$. Is \sim an equivalence relation?

Exercise 3. Define a relation \sim on $\mathbb{R}^n - \{(0, 0, \dots, 0)\}$ by declaring that $(x_1, x_2, \dots, x_n) \sim (y_1, y_2, \dots, y_n)$ if and only if there is an $r \in \mathbb{R} - \{0\}$ so that $x_i = ry_i$ for all $i \in \{1, 2, \dots, n\}$. Show that \sim is an equivalence relation.