

Assignment 2

Due Monday, Oct 18, 04, at 11:00 am and in class

Remarks: I may not grade all assignments, and Not all questions/parts will be graded on the graded assignment. You're welcome to ask me for help. Show your work and explain every step.

- (1) Determine whether the following binary relation R defined on the set $A = \mathbb{Z}$, is a partial order, a total order, an equivalence relation. If it's an equivalence relation, find all distinct equivalence classes.

$$R = \{(x, y) \in \mathbb{Z} \times \mathbb{Z} \mid x - y \in 2\mathbb{Z}\}.$$

- (2) Determine whether the following binary relation R defined on the set $A = \mathbb{R}$, is a partial order, a total order, an equivalence relation. If it's an equivalence relation, find all distinct equivalence classes.

$$R = \{(x, y) \in \mathbb{R} \times \mathbb{R} \mid x \geq y\}.$$

- (3) (a) Give an example of a binary relation on set $A = \{a, b, c, d, e\}$ that is both an equivalence relation and a partial order.
(b) Draw the Hasse diagram for $(A, \subseteq)$, where
 $A = \{\{a\}, \{a, b\}, \{a, b, c\}, \{a, b, c, d\}, \{a, c\}, \{c, d\}\}.$