Study Title

Date

※ 3.4 Equivalence Relations

- Equivalence Relation

  - Def: Relations that are reflexive, symmetric, transitive
    → on Set A, $R \subset A \times A$ is "

    ex) $A = \{1, 2, 3\}$ on Relation R ($x, y \in R$, $x \le y$)

    ① Reflexive: O (R have (1,1), (2,2), (3,3))

    ② symmetric: X (R doesn't have (2,1), (3,2))

    ③ transitive: O

    ⇒ R is not equivalence relation.

  - features

    □ The whole is partioned into non-empty classes with no common-parts.

- Partion and equivalence class

  Subsets.

  - Def: Set $\{S_1, S_2, \cdots, S_n\}$ of a set S that is not empty Satisfied the following three conditions.

    ① Each elements of S belongs to only one S_m.

    ② $S = S_1 \cup S_2 \cup \cdots \cup S_m$

    ③ $i \ne j$, $S_i \cap S_j \ne 0$

  ⇒ Let R be an equivalence relation on a set X.

  For each $a \in X$, let $[a] = \{x \in X \mid x R a\}$.

  Then $S = \{[a] \mid a \in X\}$ is a partion of X

  Equivalence classes of X given by the Relation R