

Homework 2

February 9, 2020

Cartesian Product: $A \times B = \{(a, b) | a \in A \text{ and } b \in B\}$

Relations: A relation is a set of tuples all taken from the same Cartesian product. If the relation has two elements, it is known as a binary relation, and we can generalize a binary relation R as aRb instead of $a, b \in R$ even though both notations are correct.

Functions: A function is a special relation where for every element in A , it will assign to a unique element in B . A function can be either partial (where it assigns at most one b value) or total (it yields a value for every argument in its domain).

Properties of an Equivalence Relation: In order to be an equivalence relation, a relation must be reflexive (xRx for $x \in A$), symmetric ($xRy \rightarrow yRx$ for $x, y \in A$), and transitive ($xRy \wedge yRz \rightarrow xRz$ for $x, y, z \in A$)