

Week 2 Friday

Set Theory

Due Monday Jan 25th

Practice in translating the definitions.

1)

Claim. Let f and g be functions. Then $f = g$ if and only if $\text{dom}(f) = \text{dom}(g)$ and $f(x) = g(x)$ for all $x \in \text{dom}(f)$.

2)

Claim. Let E be an equivalence relation on A . The collection of equivalence classes $A/E = \{ [a]_E \mid a \in A \}$ forms a partition of A .

An equivalence relation and a partition essentially code the same sort of structure on a set.

3)

Definition. Let A be a set. Given a partition $P = \{ P_i \}_{i \in I}$ of A , define a relation $E_P = \{ \langle a, b \rangle \mid a \in P_i \text{ and } b \in P_i \text{ for some } i \}$.

Claim. Let P be a partition of a set A . Then E_P is an equivalence relation.

4)

Claim. Let E be an equivalence relation on a set A . Using the notation from 2), we have that $E = E_{A/E}$.