2018年8月13日 星期一

Discrete Math 2018

problem set 5

1. State and explain the strategy of proving A→B for each of the following cases.
   A. B=~Q and Q is given.
   B. B=∃xP(x) and A is given.
   C. B=~∀xP(x) and A is given.
   D. B=C ∨ D and A ∧ ~C is given.
   E. B=∀x ∈ N P(x) and A is given.
2. Let Ex denote the predicate that x is even.

   A_1 :∀x:Ex↔(x=0∨(∃y:Ey∧x=SSy))

   A_2 :∀x:∅=Sx.
   A_3 :∀x∀y:Sx=Sy→x=y.

A. Express the second version of inference rule of implication elimination (→ E_2).

B. Apply (→ E_2) to prove Γ ⊢ ¬E(S0) given Γ ⊢ E(S0) → Q for some Q with Γ ⊢ ¬Q;

C. State the inference rule of ∀E.

D. Derive the result of applying rule ∀E to A_1.

E. State the rule of (→ E).

F. Apply rule (→ E) to statements

Γ ⊢ E(S0)

Γ ⊢ E(S0) → (S0=0) $\vee \exists y : (Ey \wedge S0 = SSy)$

G. State the inference rule of $\vee E_1$.

H. Derive the result of applying it to statements of

Γ,E(S0) ⊢¬(S0=0)

Γ,E(S0) ⊢ (S0=0) $\vee \exists y : (Ey \wedge S0 = SSy)$