Discrete Structure & Algorithms

Maths

30/09/2016 Fri.

2. Predicate Logic

Task 5:

(i) $(\forall x)(\exists y)(x+y=x)$

True.

For every integer(x), adding 0 equals itself.

(ii) $(\exists y)(\forall x)(x+y=x)$

True.

There is an integer(y) that adding with every integer(x) will give you the same integer(x) back.

(iii) $(\forall x)(\exists y)(x+y=0)$

True.

For every integer(x), adding with an integer(y) will be 0.

(iv) $(\exists y)(\forall x)(x+y=0)$

False.

There is an integer(y) which adding with any integer(x) gives you 0 back.

Question 2.

1. R : Russia was a superior power
   F : France was strong
   N : Napolean made an error
   A : Army faild

$$R \wedge (\neg F \vee N) \wedge \neg N \wedge (\neg A \rightarrow F) \rightarrow (A \wedge R)$$

Number	Statement	Reason
1	$R \wedge (\neg F \vee N)$	hyp
2	$\neg N$	hyp
3	$\neg A \rightarrow F$	hyp
4	R	sim 1
5	$F \vee N$	sim 1
6	$F \rightarrow N$	imp 5
7	$\neg F$	mt 2, 6
8	A	mt 3, 7
9	$A \wedge R$	con 4, 8