Home Assignment 7

Discrete Mathematics – CSC/MAT A67, Winter 2024

NEGATING STATEMENTS

Negate the following statements.

1. $\forall x \in S \;\; P(x) \Rightarrow (\exists i \in [n] \; \forall y \in S, \;\; P(x,y,i))$

   $\exists x \in S \;\; P(x) \wedge (\forall i \in [n] \; \exists y \in S, \;\; \neg P(x,y,i))$

2. $\exists x \in S \;\; (P(x) \wedge Q(x)) \Rightarrow (\exists y \in S, \;\; \neg P(x,y))$

   $\forall x \in S \;\; P(x) \wedge Q(x) \wedge (\forall y \in S, P(x,y))$

3. $\exists \; x_1,x_2,x_3 \ldots x_n \in S$ such that $\forall i,j,k \in [n] \;\; ((i < j \wedge j < k) \Rightarrow P(x_1,x_2,\ldots,x_n,i,j,k))$

   $\forall \; x_1,x_2,x_3 \ldots x_n \in S \;\; \exists i,j,k \in [n]$ such that $(i < j) \wedge (j < k) \wedge \neg P(x_1,x_2,\ldots,x_n,i,j,k)$