

## 2020春季学期“数理逻辑”课程作业四

1. 证明以下公式永真:

(1)  $\forall x A \leftrightarrow A[t/x]$ ,

(2)  $A[t/x] \rightarrow \exists x A$ .

2. 在G系统中证明下列序贯:

(1)  $\vdash \forall x(P(x) \rightarrow Q(x)) \rightarrow (\exists x P(x) \rightarrow \exists x Q(x))$ ,

(1)  $\vdash \exists x(P(x) \rightarrow Q(x)) \rightarrow (\forall x P(x) \rightarrow \exists x Q(x))$ .

3. 在G系统中证明下列序贯():

(1) **Axiom 4**  $\vdash \forall x A(x) \rightarrow A[a/x]$ ,

(2) **Axiom 5**  $\vdash \forall x(A \rightarrow B(x)) \rightarrow (A \rightarrow \forall x B(x))$ ,

4. 证明:  $\vdash A(y) \leftrightarrow \forall x((x \doteq y) \rightarrow A(x))$