7.3

1)

$[\neg(\exists Y. X \le Y)]^1$

--- $\exists I$

$\neg\neg \forall Y. \neg(X \le Y)$

--- $\neg E$

$\forall Y. \neg(X \le Y)$

--- $\forall E$

$[-X/Y]\neg(X \le Y)$

$\neg(X \le -X)$ $\quad$ $[X \le -X]^2$

--- FI

F

--- $\neg I^1$

$\neg\neg(\exists Y. X \le Y)$

--- $\neg E$

$\exists Y. X \le Y$

--- $\Rightarrow I^2$

$X \le -X \Rightarrow \exists Y. X \le Y$

--- $\forall I^*$

$\forall X. (X \le -X \Rightarrow \exists Y. X \le Y)$

2)

$[\neg \exists X (P(X) \Rightarrow \forall Y. P(Y))]^1$

$\neg\neg \forall Y. \neg(P(X) \Rightarrow \forall Y. P(Y))$

--- $\neg E$

$\forall Y. \neg(P(X) \Rightarrow \forall Y. P(Y))$

--- $\forall E$

$[Y/X]\neg(P(X) \Rightarrow \forall Y. P(Y))$

$\neg(P(Y) \Rightarrow \forall Y. P(Y))$ $\quad$ $\dfrac{\dfrac{[P(Y)]^2}{\forall Y. P(Y)}\ \forall I^*}{P(Y) \Rightarrow \forall Y. P(Y)}\ \Rightarrow I^2$

--- FI

F

--- $\neg I^1$

$\neg\neg \exists X. (P(X) \Rightarrow \forall Y. P(Y))$

--- $\neg E$

$\exists X. (P(X) \Rightarrow \forall Y. P(Y))$