

$\vdash_L (A \rightarrow T) \vdash \neg A \vdash \neg \neg A$ خنثی دلخواه از L , $A \vdash T$. \vdash_L *

 (L1) $\neg A \vdash \neg \neg A$ قفسه از L . \vdash_L

 (MP) $\neg \neg A \vdash A$ $\neg A \vdash A$. \vdash_L

$\vdash_L (A \rightarrow T) \vdash \neg A \vdash \neg \neg A$ خنثی دلخواه از L , $(\neg P_1 \rightarrow \neg P_2) \rightarrow (P_2 \rightarrow P_1)$, $A \vdash P_1 \rightarrow P_2$. \vdash_L

$\vdash_L (A \rightarrow A) \vdash A$ خنثی دلخواه از L . \vdash_L *

 (L2) $(A \rightarrow ((B \rightarrow A) \rightarrow A)) \rightarrow ((A \rightarrow (B \rightarrow A)) \rightarrow (A \rightarrow A))$. \vdash_L

(L1) $A \rightarrow ((B \rightarrow A) \rightarrow A)$

(MP) $(A \rightarrow (B \rightarrow A)) \rightarrow (A \rightarrow A)$

(L1) $A \rightarrow (B \rightarrow A)$

(MP) $A \rightarrow A$

$\vdash_L (\neg P_1 \rightarrow (\neg P_1 \rightarrow P_2)) \rightarrow (\neg P_1 \rightarrow P_2)$ خنثی دلخواه از L , \vdash_L

 $\frac{((P_1 \rightarrow (P_1 \rightarrow P_2)) \rightarrow (P_1 \rightarrow P_1)) \rightarrow ((P_1 \rightarrow (P_1 \rightarrow P_2)) \rightarrow (P_1 \rightarrow P_2))}{\text{کم سوال}}$

کم سوال از \vdash_L خنثی دلخواه از L , \vdash_L *

$P_1 \rightarrow (P_1 \rightarrow P_2) \vdash T$, $P_1 \rightarrow P_2 \vdash P_2 \rightarrow P_1$, $\vdash_L (P_1 \rightarrow P_2) \vdash P_2 \rightarrow P_1$ طبیعی

 $\vdash_L (P_1 \rightarrow P_2) \vdash P_2 \rightarrow P_1$, $\vdash_L P_2 \rightarrow P_1 \vdash P_1 \rightarrow P_2$, $\vdash_L (P_1 \rightarrow P_2) \vdash P_1 \rightarrow P_2$ طبیعی

$\vdash_L \neg A$ خرمن

 ۲-۱۱) $\neg A \rightarrow (A \rightarrow B)$ قفسه

 MP $A \rightarrow B$

$\vdash_L A \rightarrow B$ خرمن

 $\vdash_L \neg(B \rightarrow C) \rightarrow \neg A$ خرمن

 L3 $(\neg(B \rightarrow C) \rightarrow \neg A) \rightarrow (A \rightarrow (B \rightarrow C))$

 MP $A \rightarrow (B \rightarrow C)$

 L2 $(A \rightarrow (B \rightarrow C)) \rightarrow ((A \rightarrow B) \rightarrow (A \rightarrow C))$

MP $(A \rightarrow B) \rightarrow (A \rightarrow C)$

با فرض اد \vdash MP $A \rightarrow C$

$\frac{\vdash a}{\vdash L3} (\sim \sim \sim A \rightarrow \sim A) \rightarrow (A \rightarrow \sim \sim A)$

2.6 : $\vdash \sim \sim (\sim A) \rightarrow (\sim A)$

MP $A \rightarrow \sim \sim A$

فرض A

MP $\sim \sim A$

$\frac{\vdash c}{\vdash 2.11} \frac{\vdash}{\vdash} \sim A \rightarrow (A \rightarrow B)$

فرض $(A \rightarrow B) \rightarrow A$

HS $\sim A \rightarrow A$

$\frac{\vdash}{\vdash} 2.11 \frac{\vdash}{\vdash} (\sim A \rightarrow A) \rightarrow A$

MP A