Exercise Assignment for chapter on axiomatics.

1. Using the fact that \((A \lor B) \vdash (B \lor A)\) is a theorem (but making use of no other derived rules or theorems), show that \(A \vdash \neg \neg A\), \(\neg \neg A \vdash A\) and \((A \vdash B) \vdash (\neg B \vdash \neg A)\) are theorems.

2. (i) Show that \(A \lor (B \lor C) \vdash B \lor (A \lor C)\) is a theorem of SL without making use of any previously derived rules or theorems.

   (ii) Hence show that \((A \vdash (B \vdash C)) \vdash ((B \vdash (A \vdash C))\) and \((B \vdash C) \vdash ((A \vdash B) \vdash (A \vdash C))\) are theorems.