Exercise Sheet 3
Propositional Logic – Sequent Calculus and Natural Deduction

You are allowed to make use of the derived rules mentioned in lecture 5 and in lecture 5b.

Let $P \leftrightarrow Q$ be defined as $(P \to Q) \wedge (Q \to P)$.

Try to at least do one Natural Deduction proof and one Sequent Calculus proof.

1. Provide a Natural Deduction proof of $\neg(A \leftrightarrow \neg A)$.

2. Provide a Sequent Calculus proof of $\neg(A \leftrightarrow \neg A)$.

3. Provide a Natural Deduction proof of $(A \vee (B \wedge C)) \to ((A \vee B) \wedge (A \vee C))$

4. Provide a Sequent Calculus proof of $(A \vee (B \wedge C)) \to ((A \vee B) \wedge (A \vee C))$