Exercise Sheet 4
Propositional Logic – Constructive & Classical Reasoning

Note that you can submit question 6 for feedback.

1. Provide a constructive Natural Deduction proof of $\neg\neg\neg A \to \neg A$

2. Provide a constructive Natural Deduction proof of $(A \vee \neg A) \to (\neg\neg A \to A)$.

3. Provide a constructive Natural Deduction proof that $((P \to \bot) \to P) \to P$ (this is an instance of what is known as Peirce's law) implies $\neg\neg P \to P$, and vice versa.

4. Provide a classical Natural Deduction proof of $((P \to Q) \to P) \to P$.

5. Provide a classical Natural Deduction proof of $\neg(A \wedge B) \to (\neg A \vee \neg B)$.

6. [**feedback**] Provide a classical Natural Deduction proof of $(\neg B \to A) \to A \vee B$.