MAU11602 Assignment 3, Due Wednesday 21 February 2024

1. Use a tableau to show that Łukasiewicz' first axiom, $[p \supset (q \supset p)]$, is a tautology.

2. Use a tableau to show that Łukasiewicz' second axiom,

$$\{[(\neg p) \supset (\neg q)] \supset (q \supset p)\},$$

   is a tautology.

3. Give a formal proof of $\{[(\neg p) \supset (\neg q)] \supset (q \supset p)\}$ in the natural deduction system from the notes.

4. Give a formal proof of Łukasiewicz' third axiom,

$$\{[p \supset (q \supset r)] \supset [(p \supset q) \supset (p \supset r)]\},$$

   in the natural deduction system from the notes.