1996 Paper 5 Question 10

Logic and Proof

For each of the following formulæ, construct a proof in the tableau calculus or show that no proof exists.

$$((A \to B) \to A) \to A \qquad \text{[4 marks]}$$

$$\forall z\, \exists x\, \forall y\, ((P(y) \to Q(z)) \to (P(x) \to Q(x))) \qquad \text{[12 marks]}$$

$$\Box(A \to B) \wedge \Box(B \to A) \qquad \text{[4 marks]}$$

Assume S4 modal logic for the last one.