## **Proof by Contradiction**

The most familiar form of proof by contradiction is to prove a formula F by assuming  $\neg F$  and proving False. This reasoning is based on the tautology  $(\neg F \Rightarrow \text{False}) \Rightarrow F$ . Another form of proof by contradiction is to prove F by assuming  $\neg F$  and proving F. The soundness of this rule is a simple corollary of the soundness of the familiar proof by contradiction, since F and the assumption  $\neg F$  imply False. This form of proof by contradiction also follows from the tautology  $(\neg F \Rightarrow F) \Rightarrow F$ .

## Question Verify the two tautologies

$$(\neg F \Rightarrow \text{FALSE}) \Rightarrow F$$
  $(\neg F \Rightarrow F) \Rightarrow F$ 

by expressing  $\Rightarrow$  in terms of other Boolean operators.