# TUTORIAL 3

1. **Prove that $(\forall x)\ (P(x) \rightarrow Q(x))$, $(\forall x)\ (R(x) \rightarrow \neg Q(x)) \Rightarrow (\forall x)\ (R(x) \rightarrow \neg P(x))$.**
2. **Show that the conclusion $(\forall x)\ (F(x) \rightarrow \neg S(x))$ follows from the premises $(\exists x)(F(x) \wedge S(x)) \rightarrow (y)\ (M(y) \rightarrow W(y))$ and $(\exists y)\ (M(y) \wedge \neg W(y))$.**
3. **Show that $(\forall x)\ (P(x) \vee Q(x)) \Rightarrow (\forall x)\ (P(x) \vee (\exists x)\ Q(x))$ by indirect method of proof.**
4. **Show that $(x)\ (P(x) \rightarrow Q(x) \wedge (x)\ (Q(x) \rightarrow R(x)) \Rightarrow (x)\ (P(x) \rightarrow R(x)$**