

## Week #6 Exercises

Determine by the method of Truth Table or by Refutation whether the following argument is valid.

*If John has installed central heating then, either he has sold his car or he has borrowed money from the bank.*

*John has not borrowed money from the bank.*

**Therefore**

*if John has not sold his car then he has not installed central heating.*

**Abbreviations:**

*b : John has borrowed money from the bank*

*c : John has installed central heating*

*s : John has sold his car.*

Show by KE Deduction:

$$\textcircled{1} \vdash (p \rightarrow q) \vee (q \rightarrow p)$$

$$\textcircled{2} \vdash ((p \rightarrow q) \wedge (p \vee r)) \vee (p \wedge \neg q) \vee \neg(p \vee r)$$