

**Good luck!**

1. Construct the truth table for  $A \wedge B \leftrightarrow B' \vee A'$ .
2. Prove that the argument  $(P \vee Q) \wedge P' \rightarrow Q$  is valid. Justify your steps.
3. Find an interpretation in which  $\forall x \forall y [P(x, y) \rightarrow P(y, x)]$ .