

PHIL 103: Logic and Reasoning QR II

Practice #4

1. Show the following:  $\{ \} \vdash (\sim P \rightarrow \sim(P \wedge Q))$ .
2. Show the following:  $\{ (P \rightarrow \sim Q), (\sim R \rightarrow Q) \} \vdash (P \rightarrow R)$ .
3. Show the following:  $\{ ((P \rightarrow Q) \rightarrow R) \} \vdash (Q \rightarrow R)$ .
4. Show the following:  $\{ P, Q \} \vdash \sim(P \rightarrow \sim Q)$ .
5. Show the following:  $\{ (P \vee Q), \sim P \} \vdash Q$ .
6. Show the following:  $\{ \} \vdash (P \rightarrow (Q \rightarrow (P \wedge Q)))$ .
7. Show the following:  $\{ (P \rightarrow (Q \rightarrow R)) \} \vdash (Q \rightarrow (P \rightarrow R))$ .
8. Show the following:  $\{ \} \vdash ((P \rightarrow Q) \vee (Q \rightarrow P))$ .
9. Show the following:  $\{ (\sim P \vee \sim Q) \} \vdash \sim(P \wedge Q)$ .
10. Show the following:  $\{ (\sim P \wedge \sim Q) \} \vdash \sim(P \vee Q)$ .