PHIL 103: Logic and Reasoning QRII

Practice #1

1. Translate the following argument into our formal language and then use truth tables to determine whether the argument is valid or invalid.

>Either Talan took an afternoon nap or he is grumpy now (or both).
>Talan is grumpy now.
>_____
>Talan did not take an afternoon nap.

2. Translate the following argument into our formal language and then use truth tables to determine whether the argument is valid or invalid.

>If Candace studies, then she will earn an A on her exam.
>If Candace does not study, then she will earn an A on her exam.
>_____
>Candace will earn an A on her exam.

3. Use truth tables to show that the rule of conjunction introduction is valid. You may use ordinary sentence letters instead of φ and ψ.

4. Use truth tables to show that the rule of disjunction introduction is valid. You may use ordinary sentence letters instead of φ and ψ.

5. Use truth tables to show that the rule of negation introduction is valid. You may use ordinary sentence letters instead of φ and ψ.

6. Show the following: $\{ (\sim P \rightarrow Q), (P \rightarrow (R \wedge S)), (Q \rightarrow (R \wedge S)) \} \vdash R$.

7. Show the following: $\{ \sim P, \sim Q, ((\sim P \wedge \sim Q) \rightarrow (\sim R \rightarrow S)) \} \vdash (S \vee R)$

8. Show the following: $\{ Q, ((P \rightarrow Q) \rightarrow P) \} \vdash P$.

9. Without using arrow elimination ($\rightarrow$E), show the following: $\{ P, (P \rightarrow R), (Q \rightarrow R) \} \vdash R$.

10. Translate the following argument and then give a formal proof of its conclusion from its premisses.

>Michael drinks only if he is allowed to drink.
>Sally drinks only if Michael drinks.
>Michael is not allowed to drink.
>_____
>Sally doesn't drink.