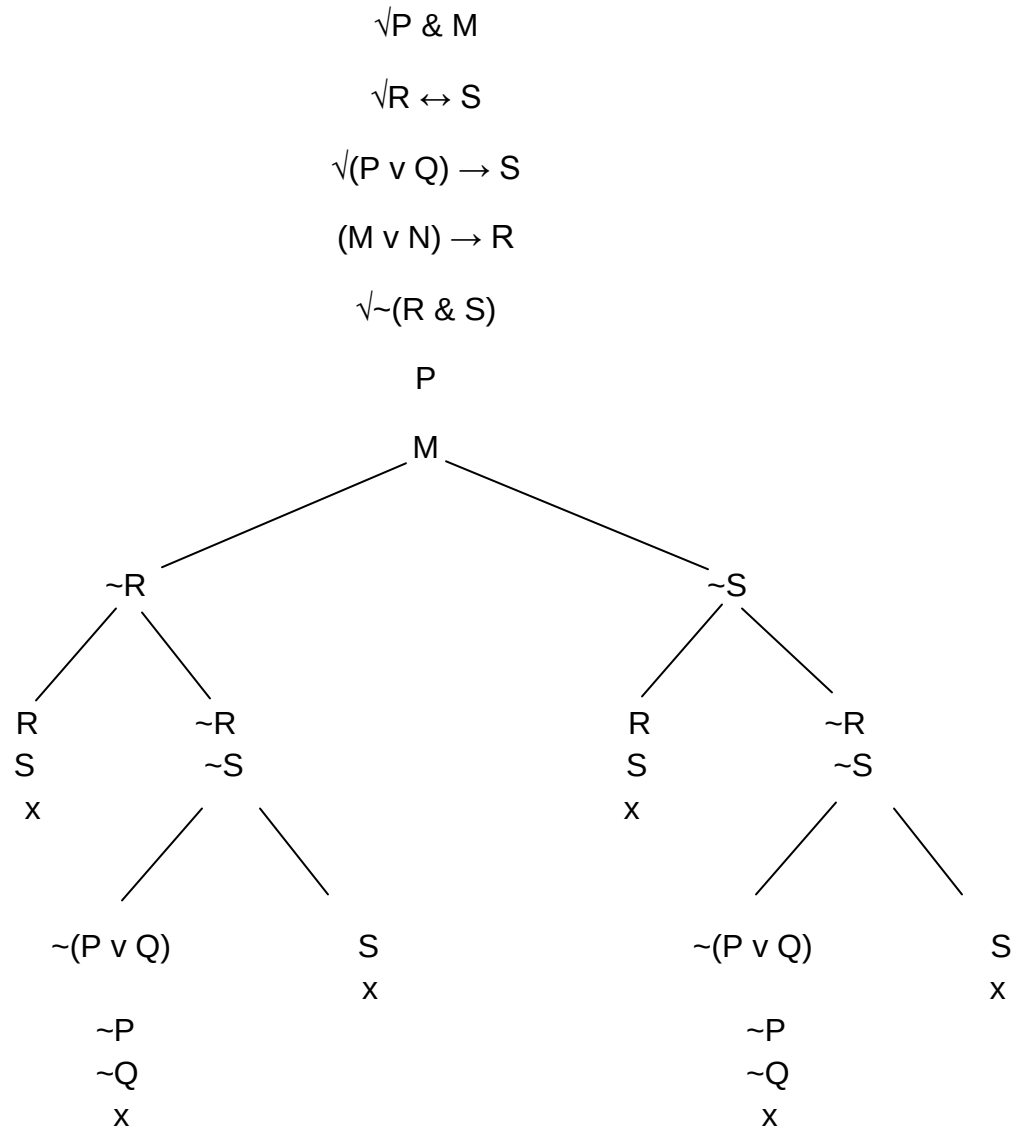
Philosophy 60
Test 4

Instructions: Use the refutation tree method to show that the following argument is valid. Then prove it using the propositional calculus on the back. You may use any of the first 8 inference rules for the latter task, but you will not require vE.

Refutation tree (5pts): $P \& M,\ R \leftrightarrow S,\ (P \vee Q) \rightarrow S,\ (M \vee N) \rightarrow R \vdash R \& S$




Valid, all branches close.

Philosophy 60
Test 4

Prove (10 pts.) $P \& M,\ R \leftrightarrow S,\ (P \vee Q) \rightarrow S,\ (M \vee N) \rightarrow R \vdash R \& S$

| | |
|---|---|
| 1. $P \& M$ | A |
| 2. $R \leftrightarrow S$ | A |
| 3. $(P \vee Q) \rightarrow S$ | A |
| 4. $(M \vee N) \rightarrow R$ | A |
| 5. $P$ | 1, &E |
| 6. $M$ | 1, &E |
| 7. $P \vee Q$ | 5, vI |
| 8. $M \vee N$ | 6, vI |
| 9. $S$ | 3,7 →E |
| 10. $R$ | 4,8 →E |
| 11. $R \& S$ | 9,10 &I |