

Mathematical Methods for Philosophy:
In-Class Exercises 22/10/2013

Exercise 1: Identify all of the positive subformula in the following formula:

1. $\neg\neg p$
2. $\neg p \vee (q \& (r \vee \neg s))$
3. $(p \rightarrow (q \rightarrow r))$
4. $(\neg p \rightarrow q)$

Exercise 2: Construct strategic proofs of the following two arguments. Make sure to write down if you “back track” at any point.

$$\begin{array}{c} \textbf{Argument 1} \\ \hline (p \vee q) \rightarrow r \\ \hline \neg((p \& \neg r) \vee (q \& \neg r)) \end{array}$$

$$\begin{array}{c} \textbf{Argument 2} \\ \hline p \rightarrow q \\ \neg p \rightarrow q \\ \hline q \end{array}$$

Exercise 3: Translate the following argument into sentential logic, and provide a proof.

- Either Jim or Jane fed the chickens, but only one of them fed the chickens.
- If the chickens were fed, then they are happy now.
- If the chickens were fed by both Jim and Jane, then would be dead from overeating.
- **Conclusion:** Either the chickens are happy now or they are dead.