Discrete Structures, Fall 2016, Homework 3

You must write the solutions to these problems legibly on your own paper, with the problems in sequential order, and with all sheets stapled together.

Complete the following proofs using the framework discussed in class. Each line of your proof must be justified with a rule of inference or logical equivalence and appropriate line numbers.

1. P1 $p \rightarrow q$
   P2 $(q \wedge \sim r) \rightarrow \sim s$
   P3 $\sim(s \rightarrow \sim p)$
   Prove: r

2. P1 y
   P2 $(m \rightarrow z) \wedge (\sim r \rightarrow s)$
   P3 $(s \wedge z) \rightarrow \sim y$
   Prove: $\sim m \vee r$

3. P1 $\sim s \vee (\sim y \wedge \sim r)$
   P2 $\sim p \vee q$
   P3 $q \rightarrow r$
   Prove: $s \rightarrow \sim(p \vee y)$

4. P1 $k \wedge p$
   P2 $m \rightarrow (p \rightarrow n)$
   Prove: $(k \rightarrow m) \rightarrow n$