1. Formal Proof (Direct Proof Rule)
Show that $\neg p \rightarrow s$ follows from $p \lor q$, $q \rightarrow r$ and $r \rightarrow s$.

2. Formal Proof
Show that $\neg p$ follows from $\neg (\neg r \lor t)$, $\neg q \lor \neg s$ and $(p \rightarrow q) \land (r \rightarrow s)$.

3. Formal Proofs in Predicate Logic
For this question only, write formal proofs.
   (a) Prove $\forall x \ (R(x) \land S(x))$ given $\forall x \ (P(x) \rightarrow (Q(x) \land S(x)))$, and $\forall x \ (P(x) \land R(x))$.
   (b) Prove $\exists x \lnot R(x)$ given $\forall x \ (P(x) \lor Q(x))$, $\forall x \ (\lnot Q(x) \lor S(x))$, $\forall x \ (R(x) \rightarrow \lnot S(x))$, and $\exists x \lnot P(x)$.

4. Odds and Ends
Prove that for every even integer, there exists an odd integer greater than that even integer.