CSE 311 Quiz Section: April 18, 2013

1. Proof with Even and Odd

In class we proved $\forall x \neg(Even(x) \land Odd(x))$ and $\forall x(Even(x) \to Even(x^2))$.
Use these as given to write a formal proof that with those predictes along with
$\forall x(Even(x) \lor Odd(x))$ you can derive $\forall x(Odd(x^2) \to Odd(x))$.

2. Proof Practice with Predicate Logic

Apply inference rules to the quantified premises to reach the desired conclusion:

1. Premises: $\forall x(P(x) \to (Q(x) \land S(x)))$
   $\forall x(P(x) \land R(x))$
   Conclusion: $\forall x(R(x) \land S(x))$

2. Premises: $\forall x(P(x) \lor Q(x))$
   $\forall x(\neg Q(x) \lor S(x))$
   $\forall x(R(x) \to \neg S(x))$
   $\exists x \neg P(x)$
   Conclusion: $\exists x \neg R(x)$

3. Extra: English Proof Practice

If $n = ab$ for positive a, b, then $a \leq \sqrt{n}$ or $b \leq \sqrt{n}$.