Math 122 In-Class Assignment 4 - Solutions

1. Use known logical implications and equivalences to show that the following argument is valid. Remember to give your reasons for each step!

$$\begin{array}{l} p \to q \\ \neg(q \wedge \neg r) \\ \hline \therefore \quad \neg r \to \neg p \end{array}$$

Solution:

Steps:	**Reasons:**
1) $p \to q$	premise
2) $\neg(q \wedge \neg r)$	premise
3) $\neg q \vee \neg\neg r$	2), DeMorgan's Law
4) $\neg q \vee r$	3), Double Negation
5) $q \to r$	4), known L.E.
6) $p \to r$	1) and 5), Chain Rule
7) $\neg r \to \neg p$	6), contrapositive (known L.E.)