Logic Arguments

Let p and q be propositions for the entirety of this worksheet (front & back).

1. Consider the following arguments using textbook notation: $\neg$, $\wedge$, and $\vee$. For each:

   (a) determine if the arguments are valid, and

   (b) set p and q to English or math propositions, that better exhibit the validity.

$$\begin{array}{r} p \\ p \to q \\ \hline \therefore q \end{array} \qquad \begin{array}{r} p \to q \\ q \\ \hline \therefore p \end{array} \qquad \begin{array}{r} \neg q \\ p \to q \\ \hline \therefore \neg p \end{array}$$

$$\begin{array}{r} p \vee q \\ \neg p \\ \hline \therefore q \end{array} \qquad \begin{array}{r} p \vee q \\ \mathrm{q} \\ \hline \therefore p \end{array} \qquad \begin{array}{r} p \to q \\ \neg p \\ \hline \neg q \end{array}$$

2. Is the following joke funny or not? Rene Descartes is drinking at the local pub. After quite a few glasses of wine (he is French after all) the bartender asked him if he would like another. Descartes said "I think not". Descartes disappeared.

1. Prove the square of an odd integer is again odd.

2. If m and n are both perfect squares, then nm is also a perfect square.