NAME:
This quiz contains 7 problems worth 30 points. You may not use books, notes, or a calculator. You have 30 minutes to take the quiz.

1. (2 points) Given that $p$ is true, $q$ is true, and $r$ is false, determine the truth value of the proposition $\neg p \vee \neg(q \wedge r)$
2. (4 points) Write the truth table for the proposition $(p \vee q) \wedge \neg p$
3. (3 points each) Let $p$ be the proposition If $x>1$, then $x$ is not a solution.
(a) State the converse of $p$.
(b) State the contrapositive of $p$.
4. (2 points) Negate the proposition If the sky is blue, then the pillow is soft. without using the words "It is not the case that ...." (Hint: Your answer should include the word and.)
5. (2 points each) Given that $p$ and $q$ are true, $r$ and $s$ are false. Determine the truth value of each proposition below.
(a) $\neg p \rightarrow(q \vee r)$
(b) $\neg(p \vee \neg q) \leftrightarrow(r \wedge s)$
(c) $p \rightarrow(q \rightarrow r)$
6. (5 points each) Determine whether each argument below is valid and justify your answer.
$p \rightarrow(q \vee r)$
(a) $p \wedge \neg q$
$\frac{r \vee q}{\therefore q}$
(b) $\begin{aligned} & p \\ & p \rightarrow q \\ & \neg q \vee r \\ & \therefore r\end{aligned}$
