Mathematics 174

Quiz # 10 Name:_____

You must show your work to get full credit.

1. Show that $\sim (p \to q)$ is logically equivalent to $p \vee \sim q$ by using truth tables.

2. (a) State DeMorgan's laws.

(b) State the definition of $p \to q$.

(c) Show that $\sim (p \to q)$ is logically equivalent to $p \vee \sim q$ by using DeMorgan's law.

3. Give the negation of the statement "Some Math174 student will fail the exam."

4. Show that if n is a positive integer that $n^2 + 3n + 2$ is a composite number.

5. Show that if n is even, then $n^2 + 3n + 7$ is odd.

6. Show that if d divides n, then d^2 divides $2n^2$.

7. Find $18 \operatorname{div} 5$ and $18 \bmod 5$. Find $-22 \operatorname{div} 5$ and $-22 \bmod 5$.

8. Write $55.123123123\ldots$ as a ratio of integers.