

CS 330 Formal Methods and Models

Quiz 3 (Spring 2011)

Instructor: Carlotta Domeniconi

February 17, 2011

Student's name:

This test is governed by the GMU Honor Code. The paper you turn in must be your sole work. Help may be obtained from the instructor to understand the description of the problem, but the solution must be the student's own work. Any deviation from this is considered a Honor Code violation.

1. [50 points]

Using rules of inference with no substitution, prove that

$$(q \rightarrow r) \rightarrow (q \rightarrow (q \wedge r))$$

Use the notation introduced in class, and state, for each line, the rule of inference that justifies it.

2. [50 points]

The following premises are given. Use rules of inference to derive the conclusion $(\neg t \vee w)$. Again, use the notation introduced in class, and state, for each line, the rule of inference that justifies it.

- | | |
|---|-------|
| 1. $\neg p \rightarrow (r \wedge \neg s)$ | given |
| 2. $t \rightarrow s$ | given |
| 3. $u \rightarrow \neg p$ | given |
| 4. $\neg w$ | given |
| 5. $u \vee w$ | given |