

Name: _____ Date: _____

CS 160, Spring 2014
Homework 1
Propositional Proofs

Please turn in a paper copy of this assignment at the beginning of your recitation on Monday, March 24th or Tuesday, March 25th, no electronic submissions for this assignment, please!

Answer all three questions.

1. (30 points) Prove using Rules of Inference and Logical Equivalences. State specific rule for each step. Use as many steps as you need.

Given: **p**
p \rightarrow **q**
 \neg **q** \vee **r**

Prove: **r**

Step Statement Reason (Include Appropriate Step # if applicable)

1.

2.

3.

4.

5.

6.

7.

Name: _____ Date: _____

CS 160, Spring 2014
Homework 1
Propositional Proofs

2. (40 points) Prove using Rules of Inference and Logical Equivalences. State specific rule for each step. Use as many steps as you need.

Given: $(p \wedge q) \rightarrow \neg r$
 r
 q

Prove: $\neg p$

Step Statement Reason (Include Appropriate Step # if applicable)

1.

2.

3.

4.

5.

6.

7.

Name: _____ Date: _____

CS 160, Spring 2014
Homework 1
Propositional Proofs

3. (30 points) Prove this equivalence using Logical Equivalences. Note that you cannot use Inference Rules (and you should know why not). State specific rule for each step. Use as many steps as you need.

$$((\neg(t \rightarrow s)) \vee t) \equiv t$$

Step Statement Reason (Include Appropriate Step # if applicable)

1.

2.

3.

4.

5.

6.

7.