

CSE 390Z: Mathematics for Computation Workshop

QuickCheck: Propositional Logic Solutions (due Monday, April 1)

Please submit a response to the following questions on Gradescope. We do not grade on accuracy, so please submit your best attempt. You may either typeset your responses or hand-write them. Note that hand-written solutions must be legible to be graded.

We have created [this template](#) if you choose to typeset with Latex. [This guide](#) has specific information about scanning and uploading pdf files to Gradescope.

0. Propositional Logic

Consider the sentence: "I do not eat pizza, or I buy groceries, or if I buy groceries then I eat pizza."

- (a) Define two atomic propositions. Then use the propositions to translate the sentence into logical notation.

Solution:

p : I eat pizza
 q : I buy groceries

$$\neg p \vee q \vee (q \rightarrow p)$$

- (b) Use a truth table to show that the sentence is always true.

Solution:

p	q	$\neg p$	$\neg p \vee q$	$q \rightarrow p$	$\neg p \vee q \vee (q \rightarrow p)$
T	T	F	T	T	T
T	F	F	F	T	T
F	T	T	T	F	T
F	F	T	T	T	T

1. Video Solution

Watch [this video](#) on the solution **after** making an initial attempt. Then, answer the following questions.

- (a) What is one thing you took away from the video solution?