

Quiz 1

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz and all logic symbols make use of the textbook notation.

1. Consider the following sentences:

p := “I come to class.” t := “The teacher is awesome.” q := “There is a quiz.”

(a) [2] (LogicWks #1) Determine if each of the above sentences are propositions.

(b) [2] (HW1 §1.1 #1) Express $\neg q \wedge p$ in an English sentence.

(c) [2] (§1.1 #27) State the contrapositive of the statement:
“If there is a quiz, then I come to class”.

2. [3] (HW1 §1.3 #3) Find a compound proposition involving the propositional variables a , b , and c that is true when a and b are true and r is false, but false otherwise.

3. (HW1 §1.4 #5) Consider the following statement,
“Every koala can climb or speak English.”

(a) [3] Express the statement above using quantifiers.

(b) [2] Negate part (a) so that no negation symbol is to the left of a quantifier.

4. [2] (logic wks #2) Let the domain be integers between -2 and 3 inclusive. Determine the truth value of $\forall x, (x + 3 \geq 0)$. Justify yourself.

5. Consider the following combinator

(a) [3] (§1.2 #41)

Find the output of the combinatorial circuit.

(b) [1] Can you write the output of the combinatorial circuit using only one logical connective?

