

Boyan
Answer key

4:50

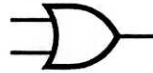
(a)

Math 55 Quiz 1
August 31, 2016

This quiz will be graded out of 15 points; the True/False question is worth 3 points, and the exercise is worth 12 points. Please read the instructions carefully.

True or False. Mark the following statements as either true or false, or leave a blank if you don't know. A correct answer is worth +1 point, a blank is worth 0 points, and an incorrect answer is worth -1 points, so be smart about guessing!

a. T The following symbol represents an OR gate in a combinatorial circuit diagram:



b. F The compound proposition $((p \wedge q) \vee (\neg p \wedge r)) \rightarrow (s \oplus t)$ has a truth table with 64 rows.

c. T For an implication $p \rightarrow q$, the *converse* is given by $q \rightarrow p$.



Exercise. Let p and q denote the propositions

p : The rain in Spain falls mainly on the plain
 q : The Spaniard's zebra is soaked

(6 points) Write an English expression to denote the compound proposition:

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

If the rain in Spain falls mainly on the plain, then the Spaniard's zebra is not soaked; however, the Spaniard's zebra is soaked.

(6 points) Additionally, construct a (complete) truth table for this proposition.

| p | q | $\neg q$ | $p \rightarrow \neg q$ | $(p \rightarrow \neg q) \wedge q$ |
|-----|-----|----------|------------------------|-----------------------------------|
| T | T | F | F | F |
| T | F | T | T | F |
| F | T | F | T | T |
| F | F | T | T | F |