

# Quiz 3

Wed Oct 14

You have up to 20 minutes. You may not use text book or notes.

1. (8 points) For any Boolean values  $X$  and  $Y$ , can  $(X + Y)'$  be rewritten as  $X' + Y'$ ?  
yes / no

Justify your answer by creating a truth table to show the results of the two expressions for all possible values of  $X$  and  $Y$ .

2. (6 points) In algebra, an operator is **commutative** if the order of its operands can be reversed. For example, standard addition is commutative because  $A + B = B + A$  for all numbers  $A$  and  $B$ . Division is **not** commutative. For example,  $\frac{4}{5} \neq \frac{5}{4}$  or in decimal notation,  $0.8 \neq 1.25$ .

Which of the Boolean operators (AND, OR, XOR) are commutative?

3. (6 points) Write the Boolean expression implemented by the following circuit diagram.

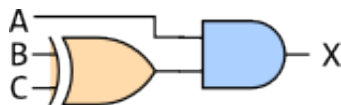


Figure 1: Diagram for question 3

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