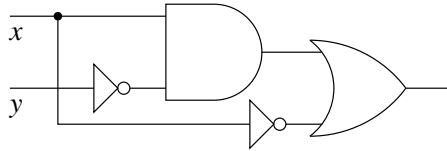


Quiz 0, CSCI 150, Fall 2003

Name: _____

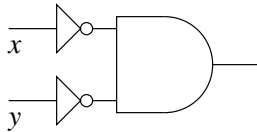
1. [10 pts] Consider the following circuit.



a. Complete the truth table.

x	y	out
0	0	
0	1	
1	0	
1	1	

- b. If you count a NOT gate as $\frac{1}{2}$ and an OR or AND gate as 1, what is the depth of this circuit?
- c. What Boolean expression corresponds most closely to this circuit's design?
2. [4 pts] At right, draw a smaller circuit (i.e., fewer gates) accomplishing the same task as the circuit at left (which represents $\bar{x}\bar{y}$).



3. [8 pts] Construct a simplified Boolean expression corresponding to the following truth table.

x	y	z	answer
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

4. [8 pts] Perform each of the following conversions.

- a. $23_{(10)}$ to binary
- b. $101101_{(2)}$ to decimal
- c. $101101_{(2)}$ to hexadecimal
- d. $1B2_{(16)}$ to binary

Solutions, Quiz 0, CSCI 150, Fall 2003

Statistics

mean	24.708 (593.000/24)
stddev	3.736
median	25.000
midrange	21.500-27.500
#1a	5.67 / 6
#1b	0.58 / 2
#1c	1.38 / 2
#2	2.54 / 4
#3	7.21 / 8
#4	7.33 / 8

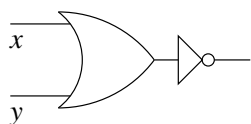
1. a.

x	y	answer
0	0	1
0	1	1
1	0	1
1	1	0

b. $2\frac{1}{2}$.

c. $x\bar{y} + \bar{x}$

2.



3. $\bar{x}\bar{z} + \bar{y}\bar{z} + xyz$ is fine, although $(\bar{x} + \bar{y})\bar{z} + xyz$ and even $\bar{x}\bar{y}\bar{z} + xyz$ is even better.

4. a. $23_{(10)} = 10111_{(2)}$

b. $101101_{(2)} = 45_{(10)}$

c. $101101_{(2)} = 2D_{(16)}$

d. $1B2_{(16)} = 1\ 1011\ 0010_{(2)}$