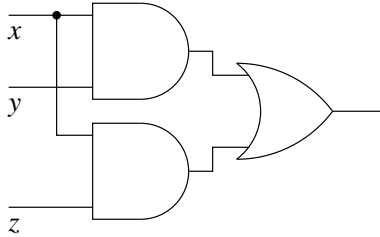


Quiz 1, CSCI 150, Fall 2003

Name: _____

1. [4 pts] At right, draw a smaller circuit (i.e., fewer gates) accomplishing the same task as the circuit at left (which represents $xy + xz$).



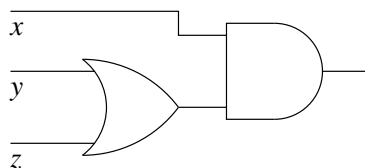
2. [10 pts] Represent each of the following integers as specified.
- 1 in a 7-bit sign-magnitude format
 - 20 in a 7-bit sign-magnitude format
 - 1 in a 7-bit two's-complement format
 - 20 in a 7-bit two's-complement format
 - 20 in a 7-bit two's-complement format
3. [10 pts] Perform each of the following conversions using the 8-bit floating-point format from class. (Recall that it used 1 sign bit, 4 bits for the excess-7 exponent, and 3 bits for the mantissa.)
- $1_{(10)}$ in floating-point format
 - $0.25_{(10)}$ in floating-point format
 - $10_{(10)}$ in floating-point format
 - 1 0111 110 to base 10
 - 1 1010 101 to base 10
4. [6 pts] What is each of the following as computed within the 8-bit floating-point format from class? Express your answers in base 10.
- $10 + 1 = ?$
 - $20 + 1 = ?$
 - $40 + 1 = ?$

Solutions, Quiz 1, CSCI 150, Fall 2003

Statistics

mean	24.625 (591.000/24)
stddev	5.376
median	26.000
midrange	21.000-30.000
#1	3.08 / 4
#2	8.92 / 10
#3	7.79 / 10
#4	4.83 / 6

1. This involves an application of the distributive law $xy + xz = x(y + z)$.



2. a. 1000001
b. 1010100
c. 1111111
d. 1101100
e. 0010100
3. a. 00111000
b. 00101000
c. 01010010
d. $-1.75_{(10)}$
e. $-13_{(10)}$
4. a. 11
b. 22
c. 40