CSE 260M - Homework 1

Always show all work for full credit.

1. Determine the largest & smallest 12-bit number as:
a. Sign/magnitude

b. Unsigned

c. Two's complement

2. Fill in the missing values in the following table:

Binary	Decimal	Hex
	38	
	268	
		AE
		32

3. Convert the following numbers to 8-bit two's complement:
a. 57

b. -42

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4. Convert the following 8-bit two's complement numbers to decimal:
a. 1001 1101

b. 0110 1110

5. Perform the following additions and subtractions of two's complement numbers:

a. 1011 0011	b. 0101 0111	c. 0011 0111
+ 0111 0110	+ 0111 0011	- 0101 1000

6. Exercise 1.73 from the text: "A majority gate produces a TRUE output if and only if more than half of its inputs are TRUE. Complete a truth table for the three-input majority gate shown in Figure 1.42."

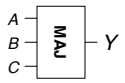

Figure 1.42

7. Convert the following 8-bit two's complement numbers to 16-bit two's complement numbers.
a. 1001 1101

b. 0110 1110

8. Without using a calculator, estimate the number of bits required to represent for the following numbers:
a. 1,500

b. 30,000,000

c. How would your answer change if you had to also represent the negative of that number?