Group Homework 5

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1. Write the following numbers in 8 bit sign magnitude, one's compliment, and two's compliment.

	SM	1's Comp	2's Comp
-123	1111 1011	1000 0100	1000 0101
+87	0101 0111	0101 0111	0101 0111
-49	1011 0001	1100 1110	1100 1111
-63	1011 1111	1100 0000	1100 0001

2. Convert the following to 8bit two's complement numbers. Perform the operation. Identify if an overflow occurred or not. Convert the answer back to decimal.

   a) 120 + 67

	0111	1000
+	0100	0011
	1011	1011

   $\rightarrow -69_{10}$

   Incorrect

   $Carry_{in} \oplus Carry_{out} = 1 \oplus 0 = 1$

   Overflow has occurred.

b) -89 - 105

	0000	1010	0111	
+	0000	1001	0111	$Carry_{in} \oplus Carry_{out} = 0 \oplus 1 = 1$
	0001	0011	1110	

$\rightarrow 62_{10}$

Overflow has occurred.

Incorrect

c) -72 - 15

	1011	1000	
+	1111	0001	$Carry_{in} \oplus Carry_{out} = 1 \oplus 1 = 0$
	1010	1001	

$\rightarrow -87_{10}$

Overflow has not occurred.

Correct