How to convert decimal numbers to 8 bit 2's complement

If you are not sure how to convert decimal numbers to 8 bit 2's complement form then have a look at this short video tutorial by PCC videos:
http://www.youtube.com/watch?v=WrSMzaEkrO4

Here's an example: Convert (– 47) into 8 bit 2's complement

Step 1) change the decimal number to binary
101111

Step 2) ensure the number is 8 bit by adding zero's to the left hand side
00101111

Step 3) invert the number by changing all the 1's to zero and all the zeros to 1
11010000

Step 4) add 1 to the right hand side
11010001

So the final answer is – 47 = 11010001

Now try these:-

a) Convert the decimal number (– 5) into 8 bit 2's complement
b) Change (– 21) into 8 bit 2's complement
c) Express (– 67) as an 8 bit 2's complement number

ANSWERS
a) 11111011
b) 11101011
c) 10111101

Binary subtraction using 8 bit 2's complement

Computers do not manage direct subtraction very well. We can get round this problem by **adding negative** numbers when they are in 8 bit 2's complement form.

Here's an example: 150 - 47

Step 1) Convert the positive number into binary making sure it is 8 bits long, if it is too short just add zeros to the left hand side.

150 = 10010110

Step 2) Convert the negative number into 8 bits 2's complement form. DO NOT convert the positive number.

- 47 = 11010001

Step 3) **Add** the numbers together using binary addition.

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  10010110
+ 11010001
  101100111
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Step 4) Ignore any overflow: If you have a 9 bit number as your final answer, ignore the biggest place value on the left hand side so that your answer is 8 bits long.

~~1~~01100111 So the final answer is 01100111

Now try these:-

1) 15 – 5 2) 77 - 21 3) 100 – 67

ANSWERS

1) 00001010

2) 00111000

3) 00100001