Task 3: 2s complement representation

Reminder: Quick method to find the 2s complement representation of a negative number:

- Write down the positive version of the number, padding it with leading zeroes: 28 = 00011100
- Starting from the right, leave every digit up to and including the first 1 alone: 100
- Then change the rest: -28 = 11100100

Repeating the process converts the number back again.

Convert the following into 8 bit 2s complement form.

1 -26 _____

2 -23 _____

3 -33 _____

4 -85 _____

5 -65 _____

6 -120 _____

7 -112 _____

8 -91 _____

Convert the following 8 bit 2s complement numbers into denary.

9 1110001 _____

10 10011011 _____

11 11001100 _____

12 10101110 _____

13 11110111 _____

14 11110011 _____

15 11011000 _____

16 01001100 _____

Task 4: Binary subtraction

Reminder: Subtraction within a computer is done by converting the second number into a negative number, in 2s complement form, then adding.

Example:	14 - 8	=	14 + (-8)		
	8	=	00001000	14	00001110
	So -8	=	11111000	-8	11111000
				6	(1)00000110

Show how a computer would carry out the following calculations in binary. Show your working.

1 18 – 9 = _____

2 26 – 15 = _____

3 17 – 34 = _____

4 51 – 14 = _____

5 15 – 37 = _____

6 49 - 11 = _____

7 41 - 1 = _____

8 -5 - 17 = _____