



**Question 1: Addition**

```

11110110 (-10)
+11110111 (-9)
-----
11111101 (-19)

```

**Question 2:**

Perform the following binary subtractions by adding the 2's complement of the subtrahend.

• **01101011 - 00010110**

One's complement of 00010110 is 11101001,

Two's complement of 00010110 is 11101010

```

11101010
+ 01101011
-----
111010100 carries
101010101    Answer = 01010101, checking: 10710 - (2210) = 8510

```

• **00101100 - 01101001**

Two's complement of 01101001 is 10010111

```

10010111
+ 00101100
-----
01111000 carries
11000011    Answer = 11000011, checking: 4410 - (10510) = -6110

```

**Question 3:**

Perform the following binary addition and indicate the result is valid/invalid.

Exercise 0111 + 0101 ----- 1110 carries 1100 invalid	Exercise 1001 + 1100 ----- 10000 carries 10101 invalid	Exercise 1100 + 0111 ----- 11000 carries 10011 = 0011 valid	Exercise 1001 + 0011 ----- 0110 carries 1100 valid
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