2. Subtraction:

a. subtraction in decimal system:

First: normal subtraction:

n1>n2, result is positive   n1<n2, result is negative

n1	47
n2	-29

+18

29
-47

-18

Second: Subtraction using 9's complement:

n1   47
n2   -29 ⟶ 70 (9's complement of (29))

n1   47
n2   +70

117 ⟶ means that the result is +ve.
1+
+18

29

- 47

-18

29

+   52 ⟶ (9's complement of (47))

0 81 ⟶ means that the result is -ve.

- 18 ⟶ and the result in 9's complement

Third: subtraction in 10's complement

```
n1      47
n2     +71
```

118 ⟶ means that the result is +ve.

+18

29

+   53   ⟶   (10's complement of (47))

82   ⟶   means that the result is -ve.

-18   ⟶   (10's complement)

---

b. subtraction in Binary system:

First: normal subtraction:

The four basic rules for subtracting bits are as follows:

$$0 - 0 = 0$$
$$1 - 1 = 0$$
$$1 - 0 = 1$$
$$10 - 1 = 1 \qquad 0 - 1 \text{ with a borrow of } 1$$

When subtracting numbers, you sometimes have to borrow from the next column to the left. A borrow is required in binary only when you try to subtract a 1 from a 0. In this case, when a 1 is borrowed from the next column to the left, a 10 is created in the column being subtracted, and the last of the four basic rules just listed must be applied. Examples 2–8 and 2–9 illustrate binary subtraction; the equivalent decimal subtractions are also shown.

EXAMPLE 2–8

Perform the following binary subtractions:

(a) 11 − 01   (b) 11 − 10

Solution

```
(a)    11      3     (b)    11      3
      −01     −1           −10     −2
       10      2            01      1
```

No borrows were required in this example. The binary number 01 is the same as 1.

Related Problem

Subtract 100 from 111.