① Calculate 10−19 in signed, 1s & 2s complement.

10 → because base 2

Signed

$19 = 10011$

$10 = 01010$ (−)

$(10-19) = 1\,01001$

2	19 − 1
2	9 − 1
2	4 − 0
2	2 − 0
	1

1's complement

$+10 = 001010$

$-19 = 110100$

$1\,01011$

↳ indicates −ve number so 1's complement is

$(10-19)_{10} = (101001)_2$

001010
110100

& carry is zero.

2's complement

$+10 = 001010$

$-19 = 110101$ → 2's complement

$19 = 10011$

$1\,01011$

here carry is ignore in 2's complement

$(10-19) = (101001)_2$ → 2's complement value.

② 20+30

Signed

1's complement

20 = 10100 = 010100

30 = 11110 = 011110

110010 110010

0

110010

2's

20 = 010100

30 = 011110

= 110010

③ 36 − 12 > n=6

1's complement

36 = 0100100 = 0100100

−12 = 001100 − = 1110011

24 0011000 ① 0010111

carry 1+

0011000

2's complement

36 = 0100100

−12 = 1110100

① 0011000

5 carry is discarded.

④ $-10 - 19$

$10 = 0\ 0\ 1\ 0\ 1\ 0$

$19 \quad\ 0\ 1\ 0\ 0\ 1\ 1$

$+29 = 0\ 1\ 1\ 1\ 0\ 1 \rightarrow$ 1's complement

$1\ 0\ 0\ 0\ 1\ 0$

2's complement

$= 1\ 0\ 0\ 0\ 1\ 1 \rightarrow$ 2's complement value.