

Arithmetic operations on binary numbers

Addition	Result
0+0	0
0+1	1
1+0	1
1+1	0 and 1 forth
1+1+1	1 and 1 forth
1+1+1+1	0 and 1 and 1 forth
1+1+1+1+1	1 and 1 and 1 forth

$$\begin{array}{r}
 \begin{array}{r}
 111 \\
 1101 \\
 111 \\
 +----- \\
 10100
 \end{array}
 \end{array}$$

1 forth

Checking the result in decimals: $13 + 7 = 20$

Multiplication	Result
0*0	0
0*1	0
1*0	0
1*1	1

$$\begin{array}{r}
 \begin{array}{r}
 100111 \\
 1001 \\
 *----- \\
 100111 \\
 000000 \\
 000000 \\
 100111 \\
 +----- \\
 101011111
 \end{array}
 \end{array}$$

1 forth

Checking the result in decimals: $39 \times 9 = 351$

Subtraction	Result
0-0	0
0-1	1
1-0	1 and b
1-1	0
b-0-0	1 and b
b-0-1	0 and b
b-1-0	0
b-1-1	1 and b
b - borrow	

$$\begin{array}{r}
 \begin{array}{r}
 \begin{array}{r}
 b \quad b \\
 11100 \\
 1011 \\
 ------ \\
 10001
 \end{array}
 \end{array}
 \end{array}$$

b-0-1

Checking the result in decimals: $28 - 11 = 17$