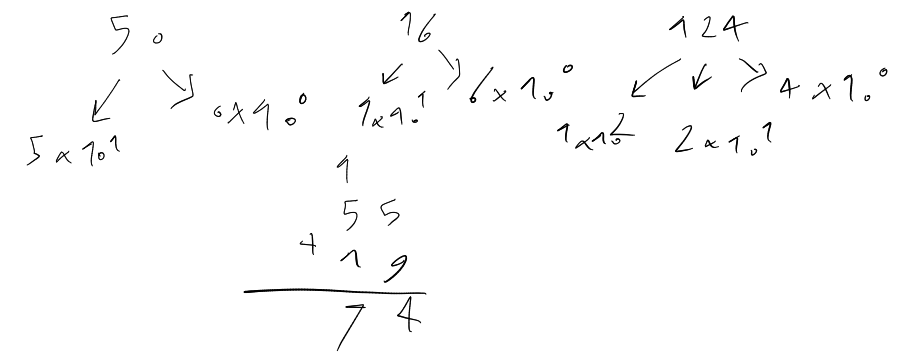
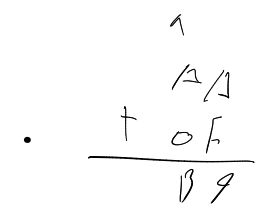
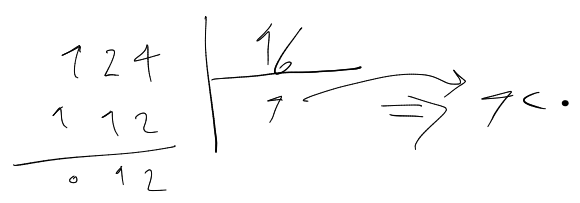
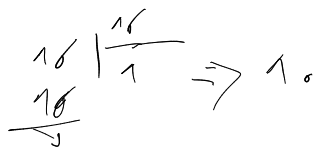
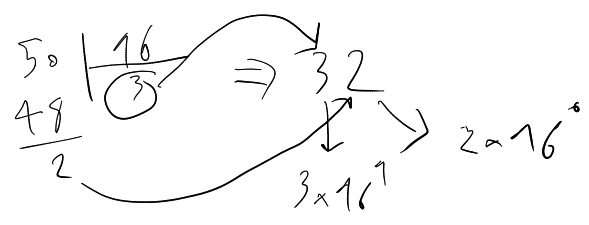


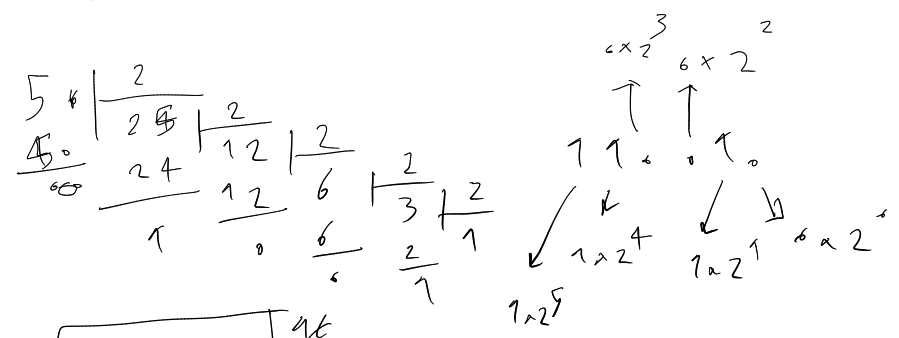
Decimal:  $1. \Rightarrow 0-9$



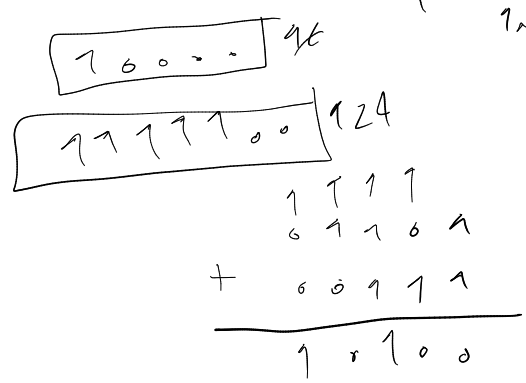
Hexadecimal:  $16 \Rightarrow 0-15 \Rightarrow 0-9, A, B, C, D, E, F$



Binary:  $2 \Rightarrow 0, 1$



4, 32, 16, 8, 4, 2, 1



4bit  $\Rightarrow 1111 \Rightarrow 0-15 \Rightarrow 2^4 \Rightarrow 0-15$

8bit  $\Rightarrow 1 \text{ byte}$

$\Rightarrow 0 \text{ on AF} \Rightarrow 1111 \Rightarrow 15$   
 $\Rightarrow 1 \text{ on AF} \Rightarrow 1111 \Rightarrow 15$   
 $\Rightarrow 0 \text{ on AF} \Rightarrow 1111 \Rightarrow 15$   
 $\Rightarrow 1 \text{ on AF} \Rightarrow 1111 \Rightarrow 15$

$$\text{overflow} \Rightarrow 1 \cdot 1 \quad 1 \cdot 1$$

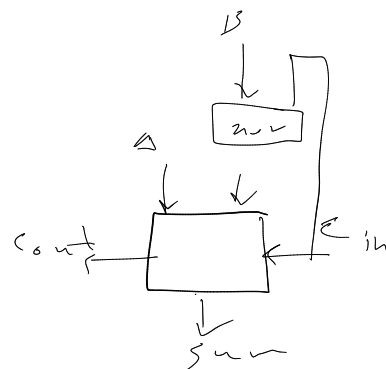
$$\underbrace{11111111}_{15} \Rightarrow \text{overflow} \Rightarrow 2^8 = 256 \Rightarrow -255$$

1's complement  $\Rightarrow 0001 \Rightarrow$  1110

0001  $\Rightarrow$  1111

2's complement  $\Rightarrow 0001 \rightarrow$

$$\begin{array}{r} 1110 \\ + \\ 0001 \\ \hline 1111 \end{array}$$



2

~~2~~

$$\begin{array}{r} 1111 \\ + \\ 0001 \\ \hline 1111 \end{array}$$

$\Rightarrow$

AND

| A | B | y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

| A | B | y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

xor

| A | B | y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |



$$4\text{bit} \Rightarrow 2^4 = 0 - 15$$

$$4\text{bit} \Rightarrow -2^{n-1} \rightarrow 2^{n-1} - 1 \Rightarrow -2^3 \rightarrow 2^3 - 1 \Rightarrow \boxed{-8 \text{ to } 7}$$

$$6 - 2 \Rightarrow \begin{array}{r} \boxed{6110} \\ 6010 \rightarrow 1111 \\ + \quad 1 \\ \hline \boxed{9110} \end{array}$$

$$\begin{array}{r} 1110 \\ + 1110 \\ \hline 0 \quad \textcircled{1} 0 0 = 4 \\ \dots \quad \cdot 1 \dots \end{array}$$

$$2 - 4 \Rightarrow \Rightarrow \begin{array}{r} 0010 \\ 0100 \Rightarrow 1111 \\ + \quad 1 \\ \hline 1100 \end{array}$$

$$\begin{array}{r} 0010 \\ 1100 \\ \hline \textcircled{1} 110 \end{array}$$

$$\begin{array}{r} 0011 \\ + \quad 1 \\ \hline \boxed{010} \end{array}$$

$$-2 \Rightarrow \textcircled{1110} \Rightarrow 8\text{bit} \quad \begin{array}{c} \dots 111 \\ 1111110 \text{ sign} \end{array}$$

$$1111 \begin{cases} \rightarrow \text{unsigned} \Rightarrow 15 \\ \rightarrow \text{sign} \Rightarrow -1 \end{cases}$$

$$101_2 \Rightarrow \boxed{1}$$

$$101_2 \Rightarrow 1, \dots \Rightarrow \boxed{2}$$

