

0

1

2

3

4

5

6

7

8

9

10

11

12

13

0
1
2
3
4
10

5

0
1
2
3
4
5
6
10

7

$$0 + 0 = 0$$

$$0 + 1 = 1$$

$$1 + 0 = 1$$

$$1 + 1 = 0 +$$

CARRY
1

$$0 \quad \text{---} \quad 0$$

$$1 \quad \text{---} \quad 1$$

$$10 \quad \text{---} \quad 2$$

$$11$$

$$\begin{array}{r}
 0000 \\
 + 0001 \\
 \hline
 0001 \\
 000 \\
 \hline
 0010 \\
 + 0001 \\
 \hline
 0011 \\
 + 0001 \\
 \hline
 0100
 \end{array}
 \begin{array}{l}
 \longrightarrow 0 \\
 \longrightarrow 1 \\
 \longrightarrow 2 \\
 \longrightarrow 3 \\
 \longrightarrow 4
 \end{array}$$

0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000

9	9	1001
A	10	1010
B	11	1011
C	12	1100
D	13	1101
E	14	1110
F	15	1111

BASE 10

BASE 2

BASE 16

$$\begin{array}{r}
 \\
 \\
 \\
 + 10001 \\
 \hline
 10000
 \end{array}$$

10^4 10^3 10^2 10^1 10^0
11,534

10,025

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	
128	64	32	16	8	4	2	1	128
								+ 16
1	0	0	1	0	1	1	0	+ 4
								+ 2
								<hr/>

$$\begin{array}{r}
 128 \\
 + 16 \\
 + 4 \\
 + 2 \\
 \hline
 (150)_{10}
 \end{array}
 \quad
 \begin{array}{l}
 (10010110)_2 \\
 \leftarrow \quad \quad \quad \rightarrow
 \end{array}$$

$$(128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1) \\ (0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 0 \ 1)_2$$

$$\begin{array}{r} 1 \\ 64 \\ 32 \\ 16 \\ 4 \\ 1 \\ \hline (117)_{10} \end{array}$$

$(178)_{10}$

$$\begin{array}{r} 178 \\ -128 \\ \hline 50 \\ -32 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 18 \\ -16 \\ \hline 2 \\ -2 \\ \hline 0 \end{array}$$

128	64	32	16	8	4	2	1
1	0	1	1	0	0	1	0

$(10110010)_2$

$$\begin{array}{r}
 (255)_{10} \\
 \hline
 128 \\
 \hline
 127 \\
 64 \\
 \hline
 63 \\
 32 \\
 \hline
 31
 \end{array}$$

$$\begin{array}{r}
 31 \\
 \hline
 16 \\
 \hline
 15 \\
 8 \\
 \hline
 7 \\
 4 \\
 \hline
 3
 \end{array}$$

$$\begin{array}{r}
 3 \\
 \hline
 2 \\
 \hline
 1 \\
 \hline
 1 \\
 \hline
 0
 \end{array}$$

128	64	32	16	8	4	2	1
1	1	1	1	1	1	1	1

$$(11111111)_2$$

$$2^8 = 256$$

8 BITS
BYTE

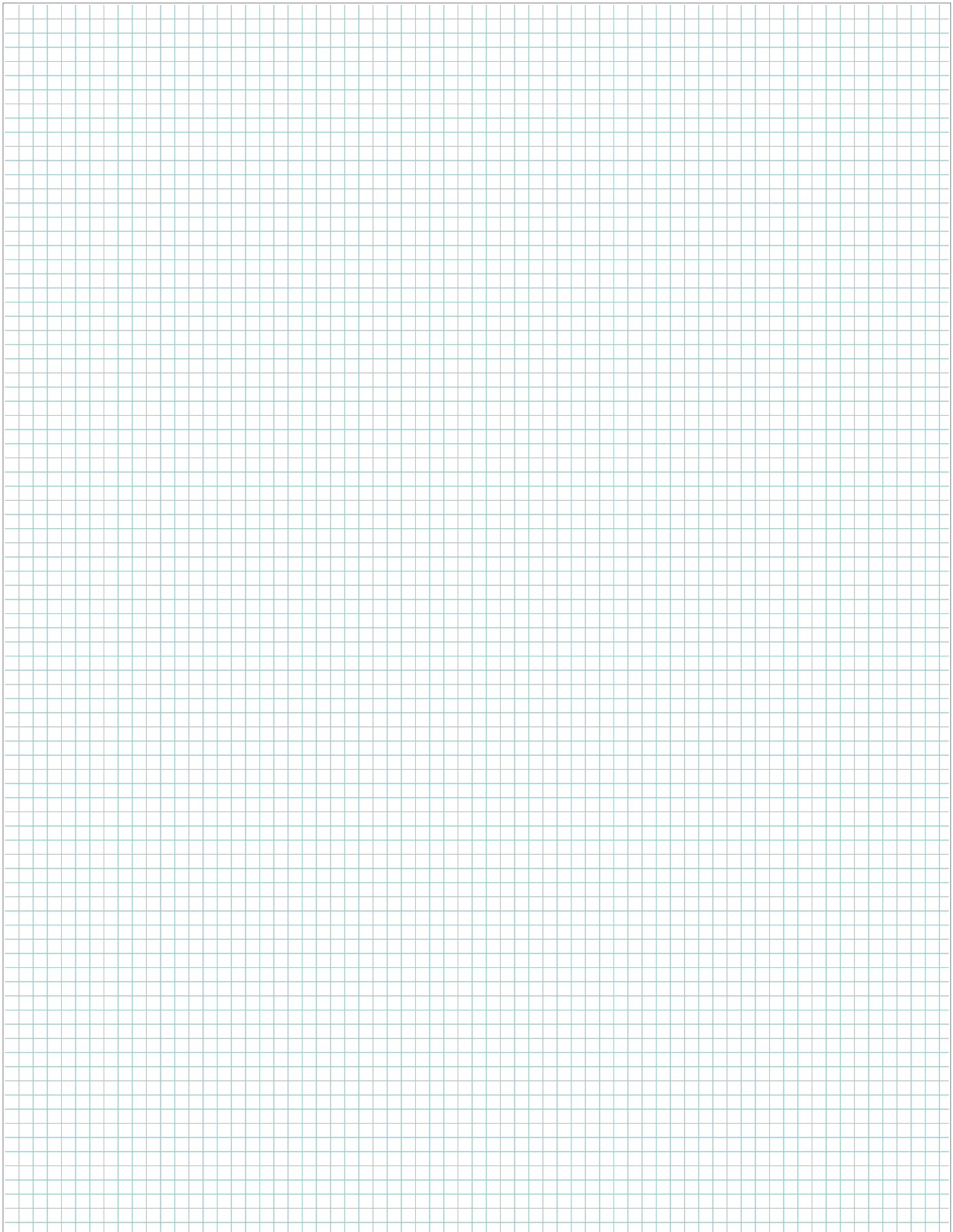
$$2^8 - 1 = 255$$

$$2^9 = 512$$

$$2^9 - 1 = 511$$

$$2^{10} = 1024$$

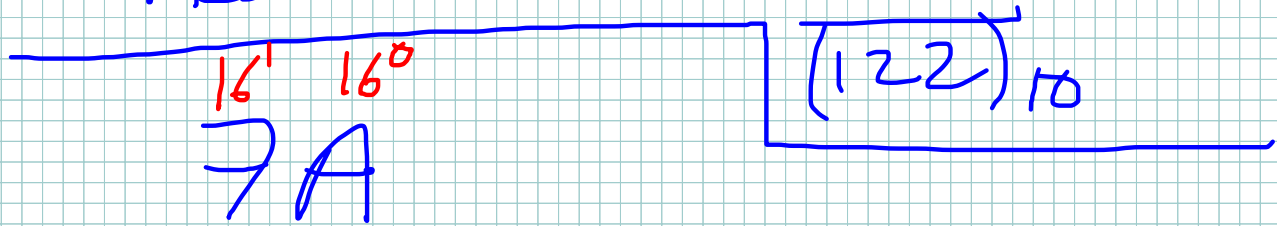
$$2^{10} - 1 = 1023$$



$(7A)_{16}$

$(0111\ 1010)_2$
NIBBLE

2
64
32
16
8
2



$$\begin{aligned} & (16^1 \times 7) + (16^0 \times A) \\ & (16 \times 7) + (1 \times 10) \\ & 112 + 10 = 122 \end{aligned}$$

$$\begin{array}{c} \text{\scriptsize } 16^2 \text{ } 16^1 \text{ } 16^0 \\ (13B)_{16} \\ (0001 \ 0011 \ 1011)_2 \end{array}$$

$$(16^2 \times 1) + (16^1 \times 3) + (16^0 \times B)$$

$$(256 \times 1) + (16 \times 3) + (1 \times 11)$$

$$256 + 48 + 11$$

$$\begin{array}{r} 256 \\ + 48 \\ + 11 \\ \hline (315)_{10} \end{array}$$

$$\begin{array}{r} 1 \\ 2 \\ -8 \\ 16 \\ 132 \\ \hline 256 \\ \hline (315)_{10} \end{array}$$