

1.6.1 → Converte para o sistema decimal:

a) 100110_2

$$\begin{array}{ccccccc} 1 & 0 & 0 & 1 & 1 & 0 \\ 5 & 4 & 3 & 2 & 1 & 0 \\ 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \\ (32) & (16) & (8) & (4) & (2) & (1) \end{array}$$

$$a^0 = 1$$

$$a^n = \underline{\underline{a \cdot a \cdot a \dots a}}^n$$

$$32 + 4 + 2 = 38$$

RESPOSTA: 38_{10}

$b7011110_2$

$$\begin{array}{r} 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 0 \\ 5 \ 4 \ 3 \ 2 \ 1 \ 0 \\ 2^5 \ 2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0 \\ \cancel{z} \ 16 \ 8 \ 4 \ 2 \ 1 \end{array}$$

$$16 + 8 + 4 + 2 = 30$$

Resposta: 30_{10}

$c7\ 111011_2$

$$\begin{array}{ccccccc} 1 & 1 & 1 & \emptyset & 1 & 1 \\ 5 & 4 & 3 & 2 & 1 & 0 \\ z^5 & z^4 & z^3 & z^2 & z^1 & z^0 \\ \textcircled{3} & \textcircled{2} & \textcircled{1} & \textcircled{6} & \textcircled{8} & \textcircled{4} & \textcircled{2} & \textcircled{1} \end{array}$$

$$32 + 16 + 8 + 2 + 1 = 59$$

Resposta: $59_{10} //$

$d_7 1010000_2$

$\begin{array}{r} 1 \varnothing 1 \varnothing \varnothing \varnothing \varnothing \\ 6 5 4 3 ? \downarrow 0 \\ z^6 z^5 z^4 z^3 z^2 z^1 z^0 \\ \textcircled{6} 4 \textcircled{5} 2 \textcircled{1} 6 8 1 2 1 \end{array}$

$$64 + 16 = 80$$

RESPOSTA: $80_{10} //$

111000101_2

$$\begin{array}{ccccccccc} 1 & 1 & \emptyset & \emptyset & \emptyset & 1 & \emptyset & 1 \\ 7 & 6 & 5 & 4 & 3 & 2 & 1 & 0 \\ 2^7 & 2^6 & 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \\ (128) & (64) & (32) & (16) & (8) & (4) & (2) & (1) \end{array}$$

$$128 + 64 + 4 + 1 = 197$$

Resposta: 197_{10}

111010110_2

$$\begin{array}{cccccccccc} 1 & 1 & \emptyset & 1 & \emptyset & 1 & 1 & \emptyset \\ 7 & 6 & 5 & 4 & 3 & 2 & 1 & 0 \\ 2^7 & 2^6 & 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \\ \textcircled{128} & \textcircled{64} & \cancel{32} & \textcircled{16} & \cancel{8} & \textcircled{4} & \textcircled{2} & \cancel{1} \end{array}$$

$$\begin{array}{r} 1 \\ 128 \\ + 64 \\ \hline 214 \end{array}$$

$$128 + 64 + 16 + 4 + 2 = 214$$

RESPOSTA: $214_{10} //$

91011001100110101₂

$$\begin{array}{r} \cancel{0} \quad 1 \quad 1 \quad \cancel{0} \quad \cancel{0} \quad 1 \quad 1 \quad \cancel{0} \quad \cancel{0} \quad 1 \quad 1 \quad \cancel{0} \quad 1 \quad 1 \quad \cancel{0} \quad 1 \quad \cancel{0} \quad 1 \\ 4096 \quad 14 \quad 13 \quad 12 \quad 11 \quad 10 \quad 9 \quad 8 \quad 7 \quad 6 \quad 5 \quad 4 \quad 3 \quad 2 \quad 1 \quad 0 \\ 8 \cancel{1} \cancel{9} \cancel{2} \quad 2^4 \quad 2^5 \quad 2^{12} \quad 2^{11} \quad 2^{10} \quad 2^9 \quad 2^8 \quad 2^7 \quad 2^6 \quad 2^5 \quad 2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 2^0 \\ \times 2 \quad \underline{} \quad 16384 \quad (8192) \quad (4096) \quad 2048 \quad 1024 \quad (512) \quad (256) \quad 128 \quad 64 \quad (32) \quad (16) \quad 8 \quad (4) \quad 1 \quad (2) \quad (1) \\ 16384 \end{array}$$

RESPOSTA: 13109₁₀/1

1.6.2 - Converte para o sistema binário.

$07\ 78_{10}$

$78\ |_2$

(0) 39 $|_2$

(1) 19 $|_2$

(1) 9 $|_2$

(1) 4 $|_2$

(0) 2 $|_2$

(0) 1 $\cancel{1}$

RESPOSTA: 1001110_2

b7 102₁₀

102 L2

(0) 5 J L2

(1) 2 S L2

(1) 1 Z L2

(0) 6 L2

(0) 3 L2

(1) (1) //

RESPOSTA: 1100110₂//

$C_7 \ 215_{10}$

$215_{10} \ L_2$

(1) $107 \ L_2$

(1) $53 \ L_2$

(1) $26 \ L_2$

(0) $13 \ L_2$

(1) $6 \ L_2$

(0) $3 \ L_2$

(1) (1)

RESPOSTA: $11010111_{2,1}$

$f_7 404_{10}$

404 L2

(0) 202 L2

(0) 101 L2

(1) 50 L2

(0) 25 L2

(1) 52 L2

(0) 6 L2

(0) 3 L2

(1) (1)

Resposta: $11010100_{2//}$

$e7\ 808_{10}$

$808\ L2$

$(0),\ 404\ L2$

$(0),\ 202\ L2$

$(0),\ 101\ L2$

$(1),\ 50\ L2$

$(0),\ 25\ L2$

$(1),\ 12\ L2$

$(0),\ 6\ L2$

$(0),\ 3\ L2$

$(1),\ (1),$

Resposta: $11\ 0010\ 1000_{2}$

$f(75429)_{10}$

5429 L_2

(1) 2714 L_2

(0), 1357 L_2

(1), 678 L_2

(0), 339 L_2

(1), 169 L_2

(1), 84 L_2

(0), 42 L_2

(0), 21 L_2

(1), 10 L_2

(0), 5 L_2

(1), 2 L_2

(0), (1)

Resposta: 1010100110101₂

g7 16383, 0

16383 L2

(1), 8191 L2

(1) 4095 L2

(1) 2047 (2)

(1) 1023 L2

(1) S11 12

(1) 253 L2

(1) 127 L2

(1) 63 L2

(1) 31 L2

(1) 15 (2)

(1) ? 3

3 12

1.6.3 - Quantos bits necessitamos para representar cada um dos números decimais abaixo?

$a_7 s 12,0$

$s 12 \lfloor 2$

$1000\ 000000$

(0) 256 $\lfloor 2$

(0) 128 $\lfloor 2$

(0) 64 $\lfloor 2$

(0) 32 $\lfloor 2$

(0) 16 $\lfloor 2$

(0) 8 $\lfloor 2$

(0) 4 $\lfloor 2$

(0) 2 $\lfloor 2$

(0), (1)

Resposta: 10 bits

b7 s2,0

s2 l2

1100

Resposta: 4 bits

(0) 6 l2

' (0) 3 l2

' (1) 1 s1,

c7 2₁₀

2 12

10

RESPOSTA: 2 bits

(0) (1)

$\frac{1}{2} \cdot \frac{1}{2}$

17 L2

1000 J

Resposta: 5 bits

(S) 8 L2

(O) 4 L2

(O) 2 L2

(O) 1 S)

Q) 33_{10}

33_{10}

100001 RESPOSTA: 6 bits

(J) 16 bits

(O) 8 bits

(O) 4 bits

(D) 2 bits
(D) (S)

f743₁₀

43 L2

101011

Resposta: 6 bits

(1) 25 L2

(1) 10 L2

(0) 5 L2

(1) 2 L2

(0) (1)

g7 7₁₀

7 12

111

Resposta: 3 bits //

(1) 3 12

(1) (1)

1.6.4 - Transforme para decimal os seguintes números binários:

Q7 11,11₂

$$\begin{array}{r} \text{←} & \text{→} \\ \begin{matrix} 1 & 1 \\ 1 & 0 \\ z^1 & z^0 \end{matrix} & \begin{matrix} 1 & 1 \\ -1 & -2 \\ z^{-1} & z^{-2} \end{matrix} \\ \textcircled{2} \textcircled{1} & \textcircled{\frac{1}{2}} \textcircled{\frac{1}{4}} \end{array}$$

$a^{-n} = \frac{1}{a^n}$

$$2 + 1 + \frac{1}{z} + \frac{1}{z^2} = 3.75_{10}$$

Resposta: 3.75_{10} //

67 1000,0001₂



1 Ø Ø Ø

3 2 1 0

z^3 z^2 z^1 z^0

(8) X X X X

Ø Ø Ø 1

-1 -2 -3 -4

z^{-1} z^{-2} z^{-3} z^{-4}

$\cancel{1}/2$ $\cancel{1}/4$ $\cancel{1}/8$ $\cancel{1}/16$

$$8 + \frac{1}{16} = 8.0625_{10}$$

Resposta: 8.0625₁₀

$01010,1010_2$

$$\begin{array}{cccc} 1 & \cancel{0} & 1 & \cancel{0} \\ 3 & 2 & 1 & 0 \\ z^3 & z^2 & z^1 & z^0 \\ 8 & \cancel{1} & 2 & \cancel{1} \end{array} \quad \begin{array}{cccc} 1 & \cancel{0} & 1 & \cancel{0} \\ -1 & -2 & -3 & -4 \\ z^{-1} & z^{-2} & z^{-3} & z^{-4} \\ \cancel{1} & \cancel{1} & \cancel{1} & \cancel{1} \\ \cancel{z} & \cancel{4} & 8 & \cancel{16} \end{array}$$

$$8 + z + \frac{1}{z} + \frac{1}{z^2} = 10.625_{10}$$

PESPOSTA: 10.625_{10}

$d_{7,100,1101_2}$

$$\begin{array}{ccccccccc} & \leftarrow & & & \rightarrow & & & & \\ 1 & 1 & \cancel{\phi} & \cancel{\phi} & & 1 & 1 & \cancel{\phi} & 1 \\ 3 & 2 & 1 & 0 & & -1 & -2 & -3 & -4 \\ z^3 & z^2 & z^1 & z^0 & & z^{-1} & z^{-2} & z^{-3} & z^{-4} \\ (8) & (4) & \cancel{2} & \cancel{1} & & (1) & (1) & \cancel{(1)} & (1) \\ & & & & & z & 4 & 8 & 16 \end{array}$$

$$8 + 4 + \frac{1}{z} + \frac{1}{4} + \frac{1}{16} =$$

RESPOSTA: $12.8125_{10} //$

27 10011,10011₂

$$\underline{1} = 0.5$$



2

1 0 0 1 1

1 0 0 1 1

$$\underline{1} = 0.25$$

4 3 2 1 0

-1 -2 -3 -4 -5

4

$z^4 z^3 z^2 z^1 z^0$

$z^1 z^{-2} z^{-3} z^{-4} z^{-5}$

$$\underline{1} = 0.125$$

16 8 4 2 1

1 1 1 1 1

8

2 1 8 16 32

$$\underline{1} = 0.0625$$

$$16 + 2 + 1 + \frac{1}{16} + \frac{1}{32} = 19,59375$$

16

2 16 32

$$\underline{1} = 0.03125$$

32

PESPOSTA: 19,59375₁₀

$111000,001101_2$

$$\begin{array}{cccccc} 1 & 1 & \cancel{0} & \cancel{0} & \cancel{0} \\ 4 & 3 & 2 & 1 & 0 \\ 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \\ 16 & 8 & 4 & 2 & 1 \end{array} \quad \begin{array}{cccccc} \cancel{0} & \cancel{0} & 1 & 1 & \cancel{0} & 1 \\ -1 & -2 & -3 & -4 & -5 & -6 \\ 2^{-1} & 2^{-2} & 2^{-3} & 2^{-4} & 2^{-5} & 2^{-6} \\ \cancel{1} & \cancel{1} & 1 & 1 & \cancel{1} & \cancel{1} \\ \cancel{2} & \cancel{4} & 8 & 16 & \cancel{32} & \cancel{64} \end{array}$$

$$16 + 8 + \underline{1} + \underline{1} + \underline{1} = 24,203125$$
$$8 \quad 16 \quad 64$$

RESPOSTA: $24,203125_{10}$

$g7 \ 100001, 011001_2$

$1 \cancel{0} \cancel{0} \cancel{0} \cancel{0} 1$

$5 \ 4 \ 3 \ 2 \ 1 \ 0$

$z^8 \ z^4 \ z^3 \ z^2 \ z^1 \ z^0$

$32 \cancel{16} \cancel{8} \cancel{4} \cancel{2} 1$

$\cancel{0} \ 1 \ 1 \ \cancel{0} \ \cancel{0} 1$

$-1 \ -2 \ -3 \ -4 \ -5 \ -6$

$z^{-1} \ z^{-2} \ z^{-3} \ z^{-4} \ z^{-5} \ z^{-6}$

$\cancel{1} \ \cancel{1} \ \cancel{1} \ \cancel{1} \ \cancel{1} \ \cancel{1}$

$\cancel{2} \ 4 \ 8 \ \cancel{16} \ \cancel{32} \ 64$

$$32 + \underline{1} + \underline{\cancel{1}} + \underline{\cancel{1}} + \underline{\cancel{1}} = 33.390625$$

RESPOSTA: $33,390625_{10}$

1.6.5 - Transforme os seguintes números decimais em binários:

a) $\underline{\overline{0,125}}_{10}$

0

$$0,125 * 2 = \underline{\overline{0,25}}$$

0

0

$$\underline{\overline{0,25}} * 2 = \underline{\overline{0,5}}$$

0

$$\underline{\overline{0,5}} * 2 = \underline{\overline{1,0}}$$

1

|
↓

RESPOSTA: $0,00\underline{\overline{1}}_2$

b70,0625,₁₀

$$\begin{array}{r} 0 \\ 0 \\ 0 \\ 0 \end{array} \quad \begin{array}{l} 0,0625 * 2 = \boxed{0},\underline{125} \\ 0,125 * 2 = \boxed{0},\underline{25} \\ 0,25 * 2 = \boxed{0},5 \\ 0,5 * 2 = \boxed{1}0 \end{array} \quad \begin{array}{r} 0 \\ 0 \\ 0 \\ | \end{array}$$

RESPOSTA: $0,0001_{2,10}$

$0,7_{10}$

$$\begin{array}{r} 0 \\ 0,7 * 2 = \boxed{1},4 & 1 \\ 0,4 * 2 = \boxed{0},8 & 0 \\ 0,8 * 2 = \boxed{1},6 & 1 \\ 0,6 * 2 = \boxed{1},2 & 1 \\ 0,2 * 2 = \boxed{0},4 & 0 \\ \underline{0,4 * 2} & \underline{\underline{0},8} & 0 \end{array}$$

RESPOSTA: $0,101100\dots_2$

d) $0,92_{10}$

$$0 \quad 0.92 * 2 = \boxed{1},84 \quad 1$$

$$0 \quad 0.84 * 2 = \boxed{1},68 \quad 1$$

$$0.68 * 2 = \boxed{1},36 \quad 1$$

$$0.36 * 2 = \boxed{0},72 \quad 0$$

$$0.72 * 2 = \boxed{1},44 \quad 1$$

$$0.44 * 2 = \boxed{0},88 \quad 0$$

$$0.88 * 2 = \boxed{1},76 \quad 1$$

$$0.76 * 2 = \boxed{1},52 \quad 1$$

$$\dots \quad 0.52 * 2 = \boxed{1},04 \quad 1$$

$$0.04 * 2 = 0.08 \quad 0$$

RÉSPONSA: $0,1110101110\dots_{(2)}$ (NÃO DEFINIDA A DÍZIMA)

Q7 7,9,10

7

$$0.9 * 2 = 1.8 \quad 1$$

7 L2

$$\underline{0.8 * 2 = 1.6} \quad 1$$

(1) 3 L2

$$0.6 * 2 = 1.2 \quad 1$$

(1) (1)

$$0.2 * 2 = 0.4 \quad 0$$

$$0.4 * 2 = 0.8 \quad 0$$

$$\underline{0.8 * 2 = 1.6} \quad 1 \quad x$$

BESPOSTA: 111, 11 10616...
₂

f7 47,47₁₀

47 12

(1) 23 12

(1) 11 12

(1) 5 12

(1) 2 12

(0) (5)

$$0.47 * 2 = 0.94 \quad 0$$

$$0.94 * 2 = 1.88 \quad 1$$

$$0.88 * 2 = 1.76 \quad 1$$

$$\underline{0.76 * 2 = 1.52} \quad 1$$

$$0.52 * 2 = 1.04 \quad 1$$

$$0.04 * 2 = 0.08 \quad 0$$

$$0.08 * 2 = 0.16 \quad 0$$

$$0.16 * 2 = 0.32 \quad 0$$

PRESPOSTA:

$$101111,01111000010100011111\dots_2$$

$$0.32 * 2 = 0.64 \quad 0$$

$$0.64 * 2 = 1.28 \quad 1$$

$$0.28 * 2 = 0.56 \quad 0$$

$$0.56 * 2 = 1.12 \quad 1$$

$$0.12 * 2 = 0.24 \quad 0$$

$$0.24 * 2 = 0.48 \quad 0$$

$$0.48 * 2 = 0.96 \quad 0$$

$$0.96 * 2 = 1.92 \quad 1$$

$$0.92 * 2 = 1.84 \quad 1$$

$$0.84 * 2 = 1.68 \quad 1$$

$$0.68 * 2 = 1.36 \quad 1$$

$$0.36 * 2 = 0.72 \quad 0$$

$$0.72 * 2 = 1.44 \quad 1$$

$$0.44 * 2 = 0.88 \quad 0$$

$$0.88 * 2 = X$$

9153,3876₁₀

5312

$$0.3876 * 2 = 0.7752 \quad 0$$

(1) 2612

$$0.7752 * 2 = 1.5504 \quad 1$$

(0) 1312

$$0.5504 * 2 = 1.1008 \quad 1$$

(1) 612

$$0.1008 * 2 = 0.2016 \quad 0$$

(0) 512

$$0.2016 * 2 = 0.4032 \quad 0$$

(1) (1)

$$0.4032 * 2 = 0.8064 \quad 0$$

$$0.8064 * 2 = 1.6128 \quad 1$$

$$0.6128 * 2 = 1.2256 \quad 1$$

$$0.2256 * 2 = 0.4512 \quad 0$$

$$0.4512 * 2 = 0.9024 \quad 0$$

$$0.9024 * 2 = 1.8048 \quad 1$$

$$0.8048 * 2 = \dots \quad \dots$$

RESPOSTA: 10101, 01100011001...₂ (NÃO IDENTIFICADO SE É DÍZIMA PERIODICA),

1.6.6 - Transforme os números octais para o sistema decimal:

a) 14_8

$$\begin{array}{r} \text{1} \quad \text{4} \\ \times \text{1} \quad \text{0} \\ \hline \text{8}^1 \quad \text{8}^0 \\ \text{8} \quad \text{1} \\ \hline \end{array}$$

$8 + 4 = 12$

RESPOSTA: 12_{10}

b7 67₈



6 7

1 0

8° 8°

8 1

x6 x7

48 + 7

55

MESPOSTA: 55 soff

C7 153₈

4

1 5 3

2 1 0

8² 8¹ 8⁰

64 8 1

x 1 x 5 x 3

64 40 3

107

RESPOSTA: 107₁₀

$$\begin{array}{r}
 1715448 \\
 \times 3210 \\
 \hline
 85 \quad 8^2 \quad 8^3 \quad 8^0 \\
 512 \quad 64 \quad 8 \quad 1 \\
 \times 1 \quad \times 5 \quad \times 4 \quad \times 4 \\
 512 + 320 + 32 + 4 \\
 \hline
 868
 \end{array}$$

RESPOSTA: 868

Q1 2063₈

$$\begin{array}{r} 2 \quad 0 \quad 6 \quad 3 \\ 3 \quad 2 \quad 1 \quad 0 \\ 8^3 \quad 8^2 \quad 8^1 \quad 8^0 \\ 512 \quad 64 \quad 8 \quad 1 \\ \times 2 \quad \times 0 \quad \times 6 \quad \times 3 \\ 1024 + 0 + 48 + 3 \\ \hline 1075 \end{array}$$

Besposta: 1075 1075

1.6.7 - Por que o número 55874 não pode ser octal?

2	3	4	5	6	7	8	9	10	...
0	0	0	0	0	:	0	0		
1	1	1	1	1	:	1	1		
2	2	2	2	2	:	2	2		
3	3	3	3	3	:	3	3		
4	4	4	4	4	:	4	4		
5					:	5	5		
						6	6		
						7	7		
							8		
							9		

Não está representando um numero em base octal pois apresenta o algarismo 8 e a base só possui os seguintes algarismos: {0, 1, 2, 3, 4, 5, 6, 7}.

1.6.8 - Converte para o sistema octal:

a) 107_{10}

107 | 8

(3) 13 | 8
 (5) (1)

RESPOSTA: $153_{8} //$

b7 185₁₀

185 L8

RESPOSTA: 271₈

(1) 23 L8
(?) (2)

c7 2048₁₀

2048 | 8

(0) 256 | 8

(0) 32 | 8

(0) (4)

resposta: 4000₈ //

d74097₁₀

4097 18

(J) 512 18

(O) 64 18

(O) 8 18

(O) (S)

MESPOSTA: 100018₁₁

27 5666₁₀

5666 18

RESPOSTA: 13042₈

(2) 708 18

(4) 88 18

(0) 11 18

(3) 1

3.6.9 - Converter os seguintes números octais em binários

a) 477_8

$$\begin{array}{c} 4 \mid 2 \\ 4(0) \quad 2(2) \\ \swarrow \quad \downarrow \\ (0)(1) \end{array} \quad \begin{array}{c} 7 \mid 2 \\ 7(1) \quad 3 \mid 2 \\ \downarrow \quad \downarrow \\ (1)(1) \end{array} \quad \begin{array}{c} 7 \mid 2 \\ 7(1) \quad 3 \mid 2 \\ \downarrow \quad \downarrow \\ (1)(1) \end{array}$$

RESPOSTA: $100111111_2 //$

b715238

1 5 | 2 2 | 2 3 | 2
 001 (1) 2 | 2 (0 | 1) (1) (1)
 101 010 011

MESPOSTA: 001103010011₂ //

174764_8

4 7 6 4
100 111 110 100

OCTAL	BINARIO
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Resposta: $10011110100_{2/1}$

676740_8

6 7 4 0
110 111 100 000

MESPOSTA: 110111100000_2 ,

OCTAL	BINARIO
0	0 0 0
1	0 0 1
2	0 1 0
3	0 1 1
4	1 0 0
5	1 0 1
6	1 1 0
7	1 1 1

07100218

1 0 0 2 1
001 000 000 010 001

RESPOSTA: 001 000 000 010 001₂,₁₁

OCTAL	BINARIO
0	0 0 0
1	0 0 1
2	0 1 0
3	0 1 1
4	1 0 0
5	1 0 1
6	1 1 0
7	1 1 1

1.6. 10 - Converte os seguintes números binários em octais:

a) 1011_2

~~1011~~

001 011
1 3

RESPOSTA: $13_{8/11}$

OCTAL	BINÁRIO
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

b) 10011100_2



0 1 0 0 1 1 1 0 0

2 3 4

RESPOSTA: 254_{10}

OCTAL	BINARIO
0	0 0 0
1	0 0 1
2	0 1 0
3	0 1 1
4	1 0 0
5	1 0 1
6	1 1 0
7	1 1 1

01110101110_2



110 101 110

6 5 6

RESPOSTA: 656_{8y}

OCTAL	BINARIO
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

$0b1000000001_2$



001 000 000 001
↓ 0 0 ↓

Resposta: 1005_8

OCTAL	BINARIO
0	0 0 0
1	0 0 1
2	0 1 0
3	0 1 1
4	1 0 0
5	1 0 1
6	1 1 0
7	1 1 1

27 1101000101₂



001 101 000 101

1 5 0 s

OCTAL BINARIO

0 000

1 001

2 010

3 011

4 100

5 101

6 110

7 111

RESPOSTA: 1505_{8//}

1.6.15 - Converte para o sistema decimal os seguintes números hexadecimais:

Q) 479_{16}

4 7 9

2 1 0

16^2 16^1 16^0

256 16 1

$\times 4$ $\underline{\times 7}$ $\underline{\times 9}$

$$1024 + 112 + 9 = 1145$$

RESPOSTA: $1145_{10/11}$

$b_1 4AB_{16}$



A B C D E F

4

A

B

10

11

12

13

14

15

2

1

0

16^2

16^1

16^0

256

16

1

x4

x10

x11

$$1024 + 160 + 11 = 1195$$

PESPOSTA: 1195_{10/11}

C) BDE_{16}

4
B D E

2 1 0

16^2 16^1 16^0

256 16 1

$\times \underline{11}$ $\times \underline{13}$ $\times \underline{14}$

2816 + 208 + 14

3038

B) Resposta: 3038₁₀ //

δ FOC₁₆

~~16~~

$$\begin{array}{cccc} F & O & C & A \\ 3 & 2 & 1 & 0 \\ 16^3 & 16^2 & 16^1 & 16^0 \\ 4096 & 256 & 16 & 1 \\ \underline{\times 15} & \underline{\times 0} & \underline{\times 12} & \underline{\times 10} \\ 61440 + 0 & + & 192 + 10 & \end{array}$$

RISPOSTA: 61642₁₀ //

01 20 3F₁₆

←
2 0 3 F

3 2 J 0

16³ 16² 16¹ 16⁰

4096 256 16 J

X2 X13 X3 X15

8192 3328 48 15

RESPOSTA: 11583₁₀//

5.6.52 - Converte os seguintes números decimais em hexadecimais:

07486₁₀

486 116

(6) 30 116
(14) (1)

RESPOSTA: 1E6₁₆

$$A = 10$$

$$B = 11$$

$$C = 12$$

$$D = 13$$

$$E = 14$$

$$F = 15$$

b7 2000, o 2000 16 RESPOSTA: 700₅₆ A = 10
40 125 (16) B = 11
80 112 (7) C = 12
(0) (13) D = 13
E = 14
F = 15

174096_{10}

4096_{16}

RESPOSTA: $1000_{16//}$

(O) 256 16

(O) 16 16

(O) (1)

$\overline{d_7 \ 5555_{10}}$

5555 16

48 347 16

75 27 21 16

-64 (1) (5) 1

115

112

(3)

RESPOSTA: 15B3₁₆

A = 10

B = 11

C = 12

D = 13

E = 14

F = 15

ex 35479₁₀

$$\begin{array}{r} 35479 \quad |16 \\ -32 \quad | \quad | \quad 2217 \quad |16 \end{array}$$

RESPOSTA: 8A97₁₆

$$\begin{array}{r} 34 \quad |16 \quad |16 \\ -32 \quad | \quad | \quad 138 \quad |16 \end{array}$$

$$\begin{array}{r} 51 \quad |16 \\ -32 \quad | \quad | \quad -128 \quad (8) \end{array}$$

$$\begin{array}{r} -48 \quad |16 \\ 27 \quad | \quad | \quad (10) \end{array}$$

$$\begin{array}{r} 187 \\ -16 \quad | \quad | \end{array}$$

$$\begin{array}{r} -128 \\ 119 \quad | \quad | \end{array}$$

$$\begin{array}{r} (9) \\ -112 \quad | \quad | \end{array}$$

(7)

$$A = 10$$

$$B = 11$$

$$C = 12$$

$$D = 13$$

$$E = 14$$

$$F = 15$$

16.13 - Converte para o sistema binário:

ain 84₁₆

8 4

1000 0100

Resposta: 10000100₂

$$2^4 = 16$$

HEXA

binário

0 0000

1 0001

2 0010

3 0011

4 0100

5 0101

6 0110

7 0111

8 1000

9 1001

A = 10 1010

B = 11 1011

C = 12 1100

D = 13 1101

E = 14 1110

F = 15 1111

$b7 \neq F_{16}$

7 F
0111 1111

Besposta: 01111111_{10}

HEXA	BINARIO
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A = 10	1010
B = 11	1011
C = 12	1100
D = 13	1101
E = 14	1110
F = 15	1111

$C13B8C_{16}$	3	B	8	C	HEXA	BINARIO
	0011	1011	1000	1100	0	0000
					1	0001
RESPOSTA:	0011101110001100 ₂	//			2	0010
					3	0011
					4	0100
					5	0101
					6	0110
					7	0111
					8	1000
					9	1001
					A = 10	1010
					B = 11	1011
					C = 12	1100
					D = 13	1101
					E = 14	1110
					F = 15	1111

1747FD₁₆

4 7 F 0
0100 0111 1111 1101

BESTA: 0100 0111 1111 1101₂ //

HEXA BINARIO

0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A = 10	1010
B = 11	1011
C = 12	1100
D = 13	1101
E = 14	1110
F = 15	1111

$17F5C0_{16}$

F J C O

1111 0001 1100 1101

RESPOSTA: 1111000111001101_{2//}

HEXA

BINARIO

0 0000

1 0001

2 0010

3 0011

4 0100

5 0101

6 0110

7 0111

8 1000

9 1001

A = 10 1010

B = 11 1011

C = 12 1100

D = 13 1101

E = 14 1110

F = 15 1111

1.6.14 - Converta os números 102_{16} e $8CF_{16}$ para o sistema octal.

102_{16}	1	0	2	HEXA	BINÁRIO
	0001	1101	0010	0	0000
	0001	1101	0010	1	0001
	0001	1101	0010	2	0010
	0001	1101	0010	3	0011
	0001	1101	0010	4	0100
	0001	1101	0010	5	0101
	0001	1101	0010	6	0110
	0001	1101	0010	7	0111
Resposta:	722	$8_{//}$			
$8CF_{16}$	8	C	F	8	1000
	1000	1100	1111	9	1001
	1000	1100	1111	A = 10	1010
	4	3	1	B = 11	1011
	4	3	1	C = 12	1100
	4	3	1	D = 13	1101
	4	3	1	E = 14	1110
	4	3	1	F = 15	1111
Resposta:	4317	$8_{//}$			

1.6.15 - Converte para o sistema hexadecimal os seguintes números binários:

4

0110011_2

0001 0011

1

3

HEXA

binário

0 0000

1 0001

2 0010

3 0011

4 0100

5 0101

6 0110

7 0111

8 1000

9 1001

A = 10 1010

B = 11 1011

C = 12 1100

D = 13 1101

E = 14 1110

F = 15 1111

RESPOSTA: 13_{16}

<u>b7 1110011100</u>	<u>0011 1001 1100</u>	<u>HEXA</u>	<u>binario</u>
3	9	C	0000
1			<u>0001</u>
2			<u>0010</u>
3			<u>0011</u>
4			<u>0100</u>
5			0101
6			0110
7			<u>0111</u>
8			1000
9			1001
A = 10			1010
B = 11			1011
C = 12			1100
D = 13			1101
E = 14			1110
F = 15			1111

MGSPOSTA: 39C₁₆//

01100110010011_2

1001 1001 0011

9 9 3

RESPOSTA: 993_{16}

HEXA

BINARIO

0 0000

1 0001

2 0010

3 0011

4 0100

5 0101

6 0110

7 0111

8 1000

9 1001

A = 10 1010

B = 11 1011

C = 12 1100

D = 13 1101

E = 14 1110

F = 15 1111

BINARIO				HEXA	BINARIO
3	E	F	2	0	0000
0011	1110	1111	0010	1	0001
<u>RESPOSTA: 3EF2₁₆ //</u>				2	0010
				3	0011
				4	0100
				5	0101
				6	0110
				7	0111
				8	1000
				9	1001
				A = 10	1010
				B = 11	1011
				C = 12	1100
				D = 13	1101
				E = 14	1110
				F = 15	1111

011000000000100010₂

1000 0000 0010 0010
8 0 2 2

RESPOSTA: 8022₁₆ //

HEXA	BINARIO
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A = 10	1010
B = 11	1011
C = 12	1100
D = 13	1101
E = 14	1110
F = 15	1111

1.6.16 - Converta os números 7500_8 e 5463_8 para hexadecimal.

HEXA	BINÁRIO
0	<u>0000</u>
1	<u>0001</u>
2	<u>0010</u>
3	<u>0011</u>
4	<u>0100</u>
5	<u>0101</u>
6	<u>0110</u>
7	<u>0111</u>
8	<u>1000</u>
9	<u>1001</u>
A = 10	<u>1010</u>
B = 11	<u>1011</u>
C = 12	<u>1100</u>
D = 13	<u>1101</u>
E = 14	<u>1110</u>
F = 15	<u>1111</u>

7 1 0 0
111 001 000 000
1110/0100/000
E 4 0

RÉSPONSA: E40_{16//}

5 4 6 3
101 100 110 011
101/100 e 10011
B 3 3

RÉSPONSA: B33_{16//}

1.6.17 - EFETUE AS OPERAÇÕES:

$$\begin{array}{r} \text{a) } 1000_2 + 1001_2 \\ \hline & \overset{1}{1000} \\ & + \underline{1001} \\ \hline & 10001_2 // \end{array}$$

$$0+0=0$$

$$0+1=1$$

$$1+0=1$$

$$\underline{1+1=10}$$

$$\begin{array}{r} \text{b7 } 1000_2 + 1110_2 \\ \hline & \overset{1}{1} 0001 \\ & + 1110 \\ \hline & 10111 \\ & \cancel{\cancel{\cancel{\cancel{1}}}} \end{array}$$

$11101_2 + 100101_2$

$\begin{array}{r} 1 \\ 100101 \end{array}$

$\underline{+ 000101}$

$101010_{2/1}$

$$011110_2 + 1001011_2 + 11101_2$$

$$1+1+1 = 1 \text{ LEVA } 1$$

$$\begin{array}{r} 111 \\ 1001011 \\ + 0001110 \end{array} \rightarrow \begin{array}{r} 11 \\ 1011001 \\ + 0011101 \end{array}$$

$1011001_2, \quad 1110110_2 //$

RESPOSTA: $1110110_2 //$

$$\underline{11110101_2} + \underline{1011001_2} + \underline{1111110_2}$$

$$\begin{array}{r} 1 & 1 & 1 & 1 & 1 & 1 \\ 1011001 & & & & & \\ + 0110101 & \rightarrow & & & & \\ \hline 10001110_2, & & & & & \end{array} \quad \begin{array}{r} 1 & 1 & 1 & 1 & 1 & 1 \\ 10001110_2 & & & & & \\ + 0111110 & \rightarrow & & & & \\ \hline 100001100_2 // & & & & & \end{array}$$

RESPOSTA: $100001100_2 //$

1.6.18 - Resolva as subtrações, no sistema binário:

$$a) \begin{array}{r} 1100_2 \\ - 1010 \\ \hline 0010_{2//} \end{array}$$

$$\begin{array}{r} 1 \ 1 \ 0 \ 0 \\ - 0 \ -1 \ -0 \ -1 \\ \hline 1 \ 0 \ 0 \ 1 \end{array}$$

$\stackrel{0}{\cancel{1}} \ 0$

-1

$10101_2 - 1110_2$

$$\begin{array}{r} 0^2 \\ \cancel{1} \cancel{0} \cancel{0}^2 \\ - 01110 \\ \hline 00111_2 \end{array}$$

$C_7H_{15}SO_2 - H_2O$

$$\begin{array}{r} & \begin{smallmatrix} 2 & 2 \\ 0 & 0 \\ 1 & 1 \\ \cancel{X} & \cancel{X} \\ 0 & 0 \end{smallmatrix} \\ - & \underline{\begin{smallmatrix} 0 & 1 & 1 & 1 & 1 \end{smallmatrix}} \\ & \begin{smallmatrix} 0 & 1 & 1 & 1 & 1 \\ \cancel{S} \\ \cancel{O} \end{smallmatrix} \end{array}$$

$11011001_2 - 11011_2$

$$\begin{array}{r} & \overset{2}{\cancel{0}} \overset{2}{\cancel{0}} \\ & \cancel{1} \cancel{0} \cancel{1} \cancel{1} \cancel{0} \cancel{0} \\ 1 & 0 1 \cancel{1} \cancel{0} \cancel{1} \\ - & 0 0 1 \cancel{1} \cancel{0} \cancel{1} \\ \hline & 0 1 1 1 1 0 \\ & // \end{array}$$

$11100000_2 - 11100_2$

$$\begin{array}{r} 0112 \\ \cancel{1}\cancel{0}\cancel{0}00 \\ - 01100 \\ \hline 000100 \end{array}$$

$_2 //$

1.6.19 - Multiplication :

$$010101_2 \times 11_2$$

$$1 * 1 = 1$$

$$1 * 0 = 0$$

$$10101$$

$$0 * 1 = 0$$

$$\underline{* 11}$$

$$0 * 0 = 0$$

$$010101$$

$$+ \underline{101010}$$

$$111111_{2//}$$

b7 $11001_2 \times 101_2$

11001

$\times 101$

0011001

0000000

$+1100100$

1111101

$_{2/1}$

$110110 \times 111_2$

$$\begin{array}{r} 110110 \\ \times 111 \\ \hline 00110110 \\ 01101100 \\ \hline +11011000 \\ \hline 101111010_2 // \end{array}$$

$$11110_2 \times 110_2$$

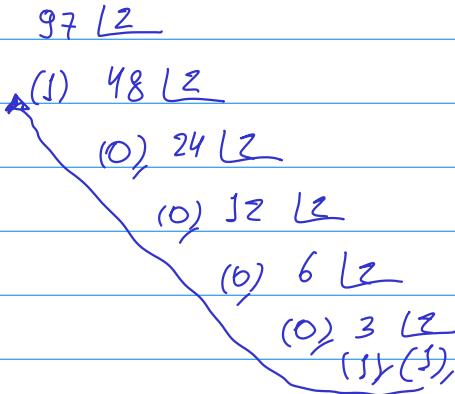
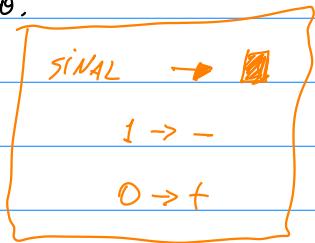
$$\begin{array}{r} 11110 \\ \times 110 \\ \hline 000000 \\ 0111100 \\ +1111000 \\ \hline 10110100_2 // \end{array}$$

$$1100110_2 \times 1010_2$$

$$\begin{array}{r} 100110 \\ \times 1010 \\ \hline 000000000 \\ 001001100 \\ 000000000 \\ + 100110000 \\ \hline 101111000_2 // \end{array}$$

$$\begin{array}{r} 11111 \\ \times 11111 \\ \hline \begin{array}{r} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 1 \\ \hline 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 \\ + 1 & 1 & 1 & 1 & 0 \\ \hline 1 & 1 & 1 & 0 & 0 \end{array} \end{array} \rightarrow \text{EXEMPLO!!!}$$

16.20 - Represente os números $+97_{10}$ e -121_{10} utilizando a notação binário-módulo.



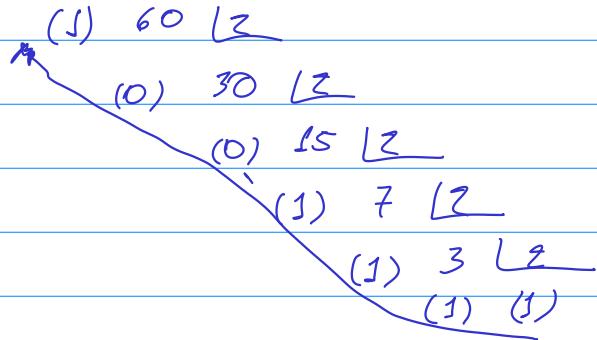
$$97_{10} = 1100001_2$$

$$+97_{10} = 01100001_2 //$$

121 L2

$$121_{10} = 1111001_2$$

$$-121_{10} = 1111001_2 //$$



1.6.25 - Estende o número 10110010 em sind-modo, o que ele representa no sistema decimal?

0 0 0 0

↑ SINAL

0 → +

1 → -

1 0 1 1 0 0 1 0

MESPOSTA: -50₁₀ //

0 1 1 0 0 1 0

6543210

6 5 4 3 2 1 0
2 2 2 2 2 2 0

643216 8421

$$32 + 16 + 2 = 50$$

1.6.22 - Determine o complemento de 1 de cada número binário:

a) 01110100_2

$10001011_2 (c_1)$

~~0 1~~

+1 +1

\sim (op. complemento 1)

$b_7 \ 1\ 1000\ 10_2$

$0011101_2 (c_s) //$

1.6.23 - Represente os seguintes números na notação do complemento de 2:

$$07 - 1011_2 \stackrel{C_1}{\Rightarrow} 0100 \stackrel{C_2}{\Rightarrow} 0100$$
$$\underline{\quad + 1 \quad}$$
$$0101_2 (C_2) //$$

$$b7_{-100001_2} \xrightarrow{C_1} 011110 \xrightarrow{C_2} 011110$$

+ 1

$$011111_2(C_2) //$$

$C_7-10111101_2 \xrightarrow{C_4} 01000010 \Rightarrow 01000010$

+1

$01000011_2 (C_2)$

$d_7 - 11010100_2 \xrightarrow{C_1} 00101011 \xrightarrow{C_2} 001010\overset{1}{0}\overset{1}{1}$

+ 1

$00101100_2 (c_2) //$

$$17 - 01010011_2 \xrightarrow{G} 10101100 \xrightarrow{C_2} 10101100$$

+ 1

10101101_{2(C_2)} //

1.6.24 - Qual é equivalente em decimal do número 10110111_2 , aqui representando em complemento de 2?

• complemento de 2 é sempre negativo //

$$\begin{array}{r} C_2 \rightarrow 10110111 \\ \underline{-1} \quad \rightarrow \quad \begin{array}{r} \cancel{1} \cancel{0} \cancel{1} \cancel{0} \cancel{1} \cancel{1} \cancel{1} \\ 76543210 \\ z^7 z^6 z^5 z^4 z^3 z^2 z^1 z^0 \\ 1686432168 // \\ 64 + 8 + 1 = 73_{10} \end{array} \end{array}$$

RESPOSTA: $-73_{10} //$

1.6.25 - Efetue as operações utilizando o complemento de 2:

$$\text{a) } \underline{101101_2} - 100111_2$$

45 - 39

[6]

$$\begin{array}{r} \cancel{1} \ 1 \\ 101101 \end{array}$$

$$+ \underline{011001}$$

$$\underline{000110}$$

6

$$-100111 \Rightarrow 100111 \Rightarrow 011000$$

$$011000$$

$$\begin{array}{r} +1 \\ \hline 011001 \end{array}$$

BESPOSTA: $000110_2 //$

$$\begin{array}{r}
 b7 \overline{10000110}_2 - \overline{110011}_2 \quad \times \overline{10000110} \\
 134 - 51 = 83 // \quad + \overline{1100110} \\
 \hline
 01010011 //
 \end{array}$$

$$\begin{array}{r}
 -00110011 \xrightarrow{c_1} 11001100 \\
 \xrightarrow{c_2} \overline{11001101}
 \end{array}$$

$$0111100_2 - 11101011_2$$

$$\underline{60 - 235} = \underline{-175}$$

$$00111100 + 00010101$$

$$-11101011 \xrightarrow{\text{C}_1} 00010100$$

$$\xrightarrow{\text{C}_2} 00010101$$

RESPOSTA: \rightarrow

$$01010001_2 (C_2)$$

01010001

-1

01010000

$10101111 \rightarrow 175$

$$\begin{array}{r}
 d_1 - 10010011_2 + 11011010_2 \\
 - 147 + 218 \\
 \hline
 71 //
 \end{array}
 \quad
 \begin{array}{r}
 * 111 \\
 11011010 \\
 + 01101101 \\
 \hline
 01000111_2 //
 \end{array}
 \quad
 \begin{array}{r}
 10010011 \xrightarrow{c_1} 01101100 \xrightarrow{c_2} \\
 \hline
 01101101
 \end{array}$$

$$17 - \overline{1001110}1 - \overline{1000101}_2$$

$$-157 - 69 = -226 //$$

$$\textcircled{I} \quad 10011101 \xrightarrow{C_1} 01100010 \xrightarrow{C_2} 01100011$$

$$\cancel{\begin{array}{r} 11 \\ 01100011 \end{array}}$$

$$+10111011$$

$$\textcircled{II} \quad 01000101 \xrightarrow{C_1} 10111010 \xrightarrow{C_2} 10111011$$

$$00011110_{(C_2)}$$

$$00011110^2$$

-1

$$00011101$$

$$-11100010 //$$

1.6.26 - Efetue em binário as operações, utilizando a aritmética do complemento de 2:

	HEXA	BINÁRIO
$0775_8 - 30_8$	$7\ 5_8$	$\begin{array}{r} \cancel{1} \\ 111101_2 \end{array}$
	$-$	$\begin{array}{r} 30_8 \\ 011000_2 \\ \downarrow c_1 \end{array}$
		100111
100101_8	$\begin{array}{r} 100101 \\ \cancel{1} \\ \hline 100111 \end{array}$	$\begin{array}{r} \downarrow c_2 \\ + 1 \\ \hline 101000_2 \end{array}$
45_8	$\begin{array}{r} 45_8 \\ // \end{array}$	$\begin{array}{r} 6 \\ 0110 \\ 7 \\ 0111 \\ 8 \\ 1000 \\ 9 \\ 1001 \\ A \\ 10 \\ B \\ 11 \\ C \\ 12 \\ D \\ 13 \\ E \\ 14 \\ F \\ 15 \end{array}$
		$\begin{array}{r} 10 \\ 1010 \\ 1011 \\ 1100 \\ 1101 \\ 1110 \\ 1111 \end{array}$

$b7\ 44_{16} - 3E_{16}$	$4\ 4$	$-$	$3\ E$	HEXA	BINARIO
	01000100_2	$-$	00111110_2	0	0000
			$\downarrow c_1$	1	0001
$\cancel{0}1000100$	11000001			2	0010
$+11000010$	$\downarrow c_2$			3	<u>0011</u>
00000110	11000001			4	0100
	<u>+1</u>			5	0101
$6_{16} //$	11000010			6	0110
				7	0111
				8	1000
				9	1001
				A	1010
				B	1011
				C	1100
				D	1101
				E	1110
				F	1111

$C7\ A9_{16} - EO_{16}$

$d_7 - BC_{16} + FC_{16}$	$- BC$	$+ FC$	HEXA	BINARIO
	-10111100_2	$+11111100_2$	0	0000
	$\downarrow c_1$		1	0001
01000011	$\begin{smallmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{smallmatrix}$	11111100	2	0010
$\downarrow c_2$	<u>$+01000100$</u>	<u>01000100_2</u>	3	<u>0011</u>
01000011			4	0100
<u>$+1$</u>			5	0101
01000100	$40_{16}/$		6	0110
			7	0111
			8	1000
			9	1001
			A 10	1010
			B 11	1011
			C 12	1100
			D 13	1101
			E 14	1110
			F 15	1111

$17 - 22_{16} - 5D_{16}$

$$\begin{array}{r}
 -2 \quad 2 \\
 -\underline{00100010_2} - \underline{00011001_2} \\
 \textcircled{1} \qquad \textcircled{2}
 \end{array}$$

$\textcircled{1} \ 11011101 \xrightarrow{C_2} 11011110_2$

$$\begin{array}{r}
 +1 \\
 \hline
 11011110_2
 \end{array}$$

$\textcircled{2} \ 11100010 \xrightarrow{C_2} 11100011$

$$\begin{array}{r}
 *11111110 \\
 +11100011 \\
 \hline
 11000001_2 //
 \end{array}$$

11000001

-1

11000000

10011111₂

$-3 F_{16} //$

HEXA	BINARIO
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A 10	1010
B 11	1011
C 12	1100
D 13	1101
E 14	1110
F 15	1111