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| **cheat sheet**  |
| **Sistemas numéricos** |
| **SISTEMAS NUMÉRICOS** | **Base 2 Base Binária** | **Base 8 Base Octal** | **Base 10 Base Decimal** | **Base 16 Base Hexadecimal** |
|  | **Bit** é a unidade mais pequena de informação e é a utilizada pelos computadores. É composta por zeros ( 0 ) e uns ( 1 ). **{0,1}** Bit significa Binary Digit. | É composta por oito algarismos que são: **{ 0, 1, 2, 3, 4, 5, 6, 7 }** | Surgiu com a necessidade humana de contar. E que tal utilizar os dedos das mãos para contar? Dez dedos, dez algarismos.É composta pelo seguinte conjunto: **{ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 }** | É composta por dezasseis algarismos que são: **{ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F }**

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| A=10B=11C=12 | D=13E=14F=15 |

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| **Qualquer número levantado a 0 é 1 (20=1) ou (80=1) ou (160=1)****Qualquer número levantado a 1 é o próprio número (21=2) ou (81=8) ou (161=16)** |
| **Conversões de (x)  para (10)** | **De Binário para Decimal** | **De Octal para Decimal** | **Fórmula** | **De Hexadecimal para Decimal** |
| **Conversão de outras bases para decimal** | 1101(2) = 1x23+1x22+0x21+1x20 =8+4+0+1=13(10) | 3467(8) = 3 x 83 + 4 x 82 + 6 x 81 + 7x 80 =3x512 + 4x64 + 6x8 + 7x1 =1536+256+48+7= 1847(10) | v=valorb=baseV1xbn-1+vn-1xbn-2+...+vn-1xb1+vnxb0 | 3DA7(16) = 3x163+13x162+10x161+7x160 =3x4096+13x256+10x16+7x1 =12288+3328+160+7=15783(10) |
| **Conversões de (10)  para (x)** | **De decimal para binário** | **De decimal para Octal** |  | **De decimal para Hexadecimal** |
|  | **33(10)=100001(2)** | **181(10)=265(8)** |  | **623(10)=26F(16)** |
| **(2)  para (x)** |  | **Binário para octal** | **De Binário para Decimal** | **Binário para hexadecimal** |
|  |  | Dividir o número binário em grupos de **3 bits** da direita para a esquerda

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| --- | --- | --- | --- |
| Binário | 10 | 001 | 110 |
| Octal | 2 | 1 | 6 |

10001110(2) → 216(8) | 1101(2) = 1x23+1x22+0x21+1x20 =8+4+0+1=13(10) | Dividir o número binário em grupos de **4 bits** da direita para a esquerda

|  |  |  |  |
| --- | --- | --- | --- |
| Binário | 1 | 1000 | 1110 |
| Hexadecimal | 1 | 8 | E |

110001110(2) → 18E(16) |
| **(16)  para (8)****&****(8)  para (16)** |  | **Hexadecimal para octal** |  | **Octal para hexadecimal** |
|  |  | **AF5(16)=5365(8)** |  | **1726(8)=3D6(16)** |
| **Tabela de equivalência entre sistemas de numeração** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| --- | --- | --- | --- |
| **Binário** | **Octal** | **Decimal** | **Hexadecimal** |
| **0** | 0 | 0 | 0 |
| **1** | 1 | 1 | 1 |
| **10** | 2 | 2 | 2 |
| **11** | 3 | 3 | 3 |
| **100** | 4 | 4 | 4 |
| **101** | 5 | 5 | 5 |
| **110** | 6 | 6 | 6 |
| **111** | 7 | 7 | 7 |
| **1000** | 10 | 8 | 8 |
| **1001** | 11 | 9 | 9 |
| **1010** | 12 | 10 | A |
| **1011** | 13 | 11 | B |
| **1100** | 14 | 12 | C |
| **1101** | 15 | 13 | D |
| **1110** | 16 | 14 | E |
| **1111** | 17 | 15 | F |
| **10000** | 20 | 16 | 10 |
| **...** | ... | ... | ... |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pos** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **total** |
| **Pos** | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 |  |
| **Val** | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | 255 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pos** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **total** |
| **Pos** | 87 | 86 | 85 | 84 | 83 | 82 | 81 | 80 |  |
| **Val** | 2097152 | 262144 | 32768 | 4096 | 512 | 64 | 8 | 1 | 2396745 |

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|  | **www.ticmania.net** |