

Number Systems



CCNA1v7 Module 5 Number Systems



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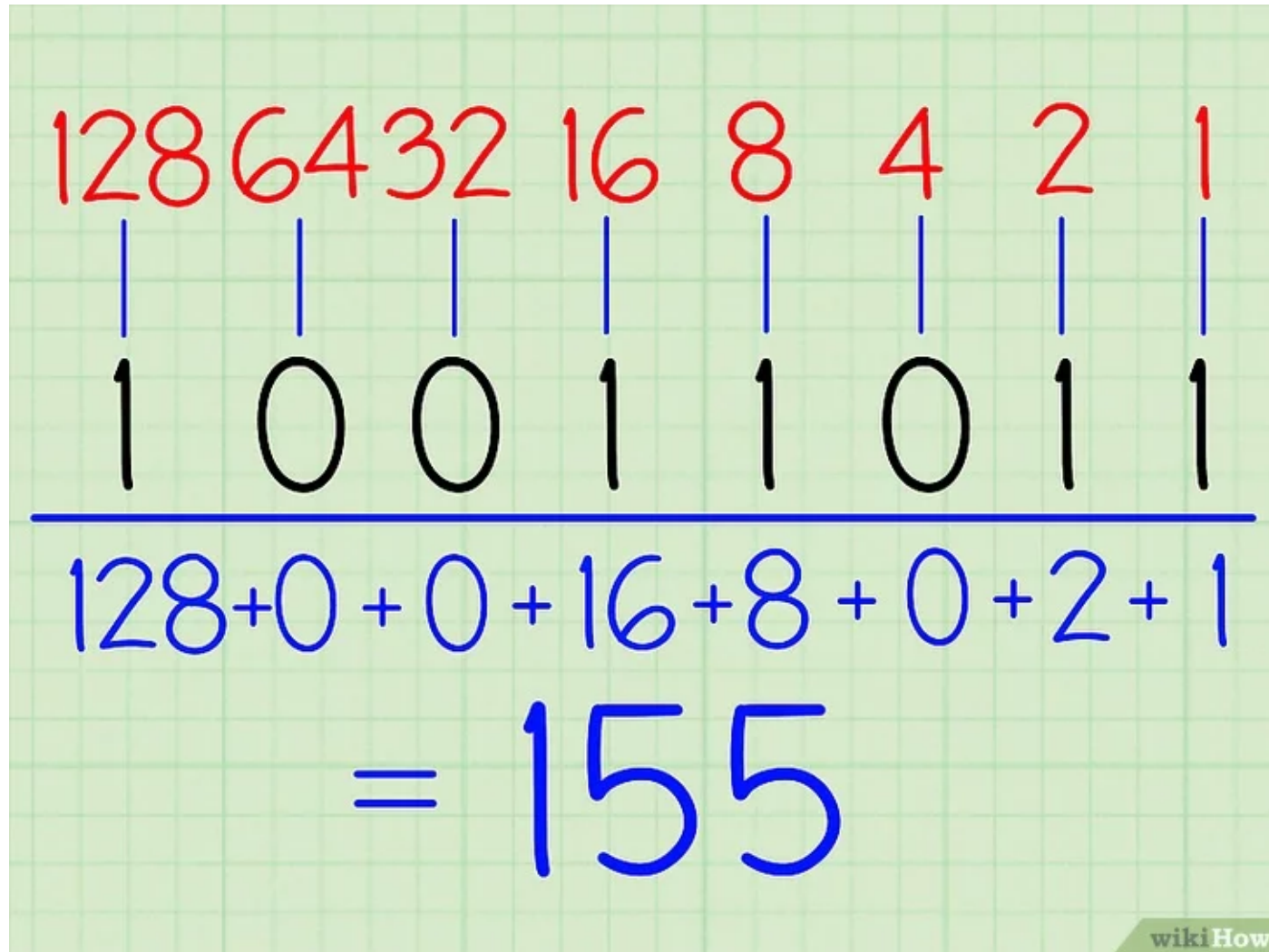
Decimal - Binary - Hexadecimal

Decimal
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Binary
0000
0001
0010
0011
0100
0101
0110
0111
1000
1001
1010
1011
1100
1101
1110
1111

Hexadecimal
0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

Binary to decimal conversion



A handwritten diagram on green grid paper showing the conversion of the binary number 10011011 to decimal. The powers of two (128, 64, 32, 16, 8, 4, 2, 1) are written in red at the top. Below them, the corresponding binary digits (1, 0, 0, 1, 1, 0, 1, 1) are written in black. A horizontal blue line separates the binary digits from the calculation below. The calculation, written in blue, shows the sum of the powers of two for which the binary digit is 1: 128 + 0 + 0 + 16 + 8 + 0 + 2 + 1. The final result, 155, is written in large blue numbers.

128	64	32	16	8	4	2	1
1	0	0	1	1	0	1	1
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128+0+0+16+8+0+2+1							
= 155							

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Decimal to binary conversion

156₁₀

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

$156 - 128 = 28$
 $28 - 16 = 12$
 $12 - 8 = 4$

The diagram illustrates the process of converting the decimal number 156 to binary. It shows a table of powers of 2 (128, 64, 32, 16, 8, 4, 2, 1) with the values 16 and 8 circled in red. Below the table, the binary digits 1, 0, 0, 1, 1 are shown. The conversion steps are shown as a series of subtractions: 156 - 128 = 28, 28 - 16 = 12, and 12 - 8 = 4. A hand holding a green pen is shown writing the final result.

Binary to hexadecimal conversion and viceversa

$(11)(1011)(0010)(1001)$

11	→	0011	→	3
1011	→	1011	→	B
0010	→	0010	→	2
1001	→	1001	→	9

$(11)(1011)(0010)(1001) = \boxed{3B29}$

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