

BASE BINAIRE

1 / De la base binaire à la base décimale ★

1. Compléter les décompositions en base 2 des nombres binaires 11_2 , 101_2 , 1010_2 et 10011_2 .

$$11_2 = \underline{1} \times 2^1 + \underline{1} \times 2^0$$

$$1010_2 = \underline{1} \times 2^3 + \underline{0} \times 2^2 + \underline{1} \times 2^1 + \underline{0} \times 2^0$$

$$101_2 = \underline{1} \times 2^2 + \underline{0} \times 2^1 + \underline{1} \times 2^0$$

$$10011_2 = \underline{1} \times 2^4 + \underline{0} \times 2^3 + \underline{0} \times 2^2 + \underline{1} \times 2^1 + \underline{1} \times 2^0$$

2. Convertir les nombres entiers 11_2 , 101_2 , 1010_2 et 10011_2 de la base binaire à la base décimale.

$$11_2 = \underline{3}_{10}$$

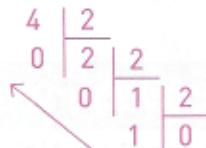
$$1010_2 = \underline{10}_{10}$$

$$101_2 = \underline{5}_{10}$$

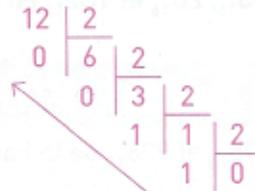
$$10011_2 = \underline{19}_{10}$$

2 / De la base décimale à la base binaire ★★

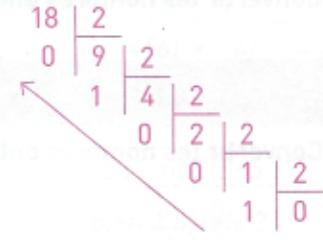
1. Convertir les nombres entiers 4_{10} , 12_{10} et 18_{10} de la base décimale à la base binaire.



$$4_{10} = 100_2$$



$$12_{10} = 1100_2$$



$$18_{10} = 10010_2$$

2. Vérifier vos résultats en convertissant les valeurs trouvées dans la base décimale.

$$100_2 = \underline{1} \times 2^2 + \underline{0} \times 2^1 + \underline{0} \times 2^0 = 4_{10}$$

$$1100_2 = \underline{1} \times 2^3 + \underline{1} \times 2^2 + \underline{0} \times 2^1 + \underline{0} \times 2^0 = 12_{10}$$

$$10010_2 = \underline{1} \times 2^4 + \underline{0} \times 2^3 + \underline{0} \times 2^2 + \underline{1} \times 2^1 + \underline{0} \times 2^0 = 18_{10}$$

3 / Quelques conversions binaires ★★

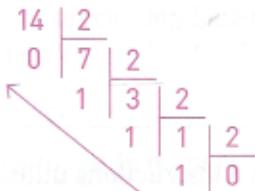
Remplir le tableau suivant en effectuant les calculs ci-dessous.

Base 10	14_{10}	$\dots 8_{10} \dots$	20_{10}	$\dots 38_{10} \dots$	61_{10}	$\dots 148_{10} \dots$
Base 2	$\dots 1110_2 \dots$	1000_2	$\dots 10100_2 \dots$	100110_2	$\dots 111101_2 \dots$	10010100_2

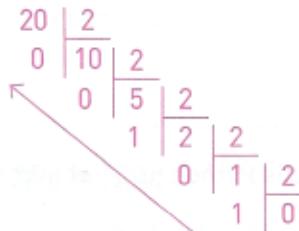
$$1000_2 = \underline{1} \times 2^3 + \underline{0} \times 2^2 + \underline{0} \times 2^1 + \underline{0} \times 2^0 = 8_{10}$$

$$100110_2 = \underline{1} \times 2^5 + \underline{0} \times 2^4 + \underline{0} \times 2^3 + \underline{1} \times 2^2 + \underline{1} \times 2^1 + \underline{0} \times 2^0 = 38_{10}$$

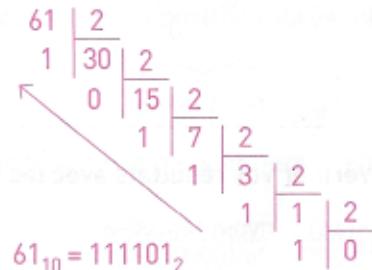
$$10010100_2 = \underline{1} \times 2^7 + \underline{0} \times 2^6 + \underline{0} \times 2^5 + \underline{1} \times 2^4 + \underline{0} \times 2^3 + \underline{1} \times 2^2 + \underline{0} \times 2^1 + \underline{0} \times 2^0 = 148_{10}$$



$$14_{10} = 1110_2$$



$$20_{10} = 10100_2$$



$$61_{10} = 111101_2$$