

## Exercice noté 1

1.

$$\begin{aligned} \text{a) } 12345_7 &= (1 \times 7^4) + (2 \times 7^3) + (3 \times 7^2) + (4 \times 7^1) + (5 \times 7^0) \\ &= 2401 + 686 + 147 + 28 + 5 \end{aligned}$$

$$\begin{aligned} \text{b) } 2AA3_{16} &\rightarrow \text{base 10} \\ &= (2 \times 16^3) + (10 \times 16^2) + (10 \times 16^1) + (3 \times 16^0) \\ &= 8192 + 2560 + 160 + 3 \\ &= 10915_{10} \end{aligned}$$

$$\begin{aligned} \text{c) } 4B_{16} &\rightarrow \text{base 10} \\ (4 \times 16^1) + (4 \times 16^0) &= 64 + 11 = 75_{10} \end{aligned}$$

$$\begin{aligned} 4B_{16} &\rightarrow \text{base 2} \\ 4 &= 0100 \\ B &= 1011 \\ 4B_{16} &= 01001011_2 \end{aligned}$$

$$\begin{aligned} 4B_{16} &\rightarrow \text{base 8} \\ \text{En sachant que } 4B_{16} &= 75_{10} \end{aligned}$$

$$\begin{array}{r} 75 \overline{) 8} \\ - 72 \quad 9 \quad \overline{) 8} \\ \hline 3 \quad \overline{) 8} \\ - 8 \quad 1 \quad \overline{) 8} \\ \hline 0 \quad 1 \quad \overline{) 8} \\ - 8 \quad 0 \\ \hline 0 \end{array} = 113_8$$

$$\text{d) } 1011_{10} \rightarrow \text{base 16 (notation JavaScript)}$$

$$\begin{array}{r} 1011 \overline{) 16} \\ - 1008 \quad 63 \quad \overline{) 16} \\ \hline 3 \quad \overline{) 16} \\ - 48 \quad 3 \quad \overline{) 16} \\ \hline 0 \quad 15 \quad \overline{) 16} \\ - 48 \quad 3 \\ \hline 0 \end{array}$$

0x3F3

$$c) 0Xee = 238_{10}$$

$$\begin{array}{|c|c|} \hline 14 & 14 \\ \hline \end{array} = (14 \times 16^0) + (14 \times 16^1) = 238_{10}$$

$$2. 17_{10} \rightarrow \text{base } 2, \text{ non signé } n=5$$

$$17_{10} = 2^4 + 2^0 = 10001_2$$

$$3. 01101 = (1 \times 2^0) + (1 \times 2^2) + (1 \times 2^3) = 13$$

↳ Nombre positif

$$\begin{array}{r} 10011 \\ 01100 \\ +1 \\ \hline 01101 \end{array}$$

$$\text{Donc } 10011_2 = -13_{10}$$

$$4. V = (-1)^s \times (1 + f(2^{-52})) \times 2^{(e-1023)}$$

$$3.15:$$

$$1) 3_{10} = 11$$

$$2) 0,15_{10} = ?$$

$$0,15 \times 2 = 0,30$$

$$0,30 \times 2 = 0,60$$

$$0,60 \times 2 = 1,20$$

$$0,20 \times 2 = 0,40$$

$$0,40 \times 2 = 0,80$$

$$0,80 \times 2 = 1,60$$

$$0,60 \times 2 = 1,20$$

$$0,20 \times 2 = 0,40$$

$$0,40 \times 2 = 0,80$$

$$0,80 \times 2 = 1,60$$

...

$$00100110011$$

$$3) 3,15_{10} = 11.00100110011..._2$$

$$11.00100110011 = 1.\underbrace{00100110011}_f \times 2^1$$

$$4) e - 1023 = 1$$

$$1023 + 1 = e = 1024$$

champs :

$s = 0$  (car il s'agit d'un nombre positif)

$$e = 1024$$

$$f = 100100110011 \dots$$

-4 :

$$1) 4_{10} = 1000_2$$

$$2) 1000 = 1 \cdot \underbrace{000}_f \times 2^3$$

$$3) e - 1023 = 3$$

$$1023 + 3 = e = 1026$$

champs :

$s = 1$  (car il s'agit d'un nombre négatif)

$$e = 1026$$

$$f = 000 \dots 0$$

$$5. 10 - (3 - 4 + 2) = 9$$

