EXO

1. a) 243,125

```
243 | 2          2× | 0,125        11110011,001
121 | 1            0 | ,25         1,1110011001  × 10⁷
 60 | 1          ↓ 0 | ,5
 30 | 0            1 | ,0          7+127 = 134
 15 | 0 ↑
  7 | 1         134 | 2
  3 | 1          67 | 0
  1 | 1          33 | 1
  0 | 1          16 | 1 ↑
                  8 | 0
                  4 | 0
                  2 | 0
                  1 | 0
                  0 | 1
```

$1,1110011001 \times 10^7$

$7 + 127 = 134$

| 0 | 10000110 | 11100110010000000000000 |

b) 5412,15

```
5412 | 2              2× 0,15          1010100100100,001001‾
2706 | 0              0↑,3             1,010100100100001001  ×10^12
1353 | 0          ↓   0 ,6
 676 | 1              1 ,2                12 + 127 = 139
 338 | 0              0 ,4
 169 | 0              0 ,8             0|10001011|01010010010000100110011
  84 | 1  ↑          1 ,6
  42 | 0
  21 | 0          139 | 2
  10 | 1           69 | 1
   5 | 0           34 | 1
   2 | 1           17 | 0
   1 | 0            8 | 1
   0 | 1            4 | 0  ↑
                    2 | 0
                    1 | 0
                    0 | 1
```

c) -58,25

```
58 | 2           2× 0,25        -(111010,01) = -(1,110100 1 ×10^5)
29 | 0           ↓0,5
14 | 1  ↑         1,0            127 = 0 1111111
 7 | 0                             5 = 0000 0101
 3 | 1                              1000 0100‾
 1 | 1
 0 | 1          11|10000100|1101001000000000000000001
```

d) -175,58

```
175 | 2          2× 0,58       1010 1111,1001010001111010
 87 | 1           1 ,16        1,0101111001010001111010  ×10^7
 43 | 1          ↓0 ,32
 21 | 1           0 ,64         127 : 0 1111111
 10 | 1  ↑        1 ,28           7 : 0000 0111
  5 | 0           0 ,56             1000 0110‾
  2 | 1           1 ,12
  1 | 0           0 ,24        1|10000110|0101111001010001111010
  0 | 1           0 ,48
                  0 ,96
                  1 ,92
                  1 ,84
                  1 ,68
                  1 ,36
                  0 ,72
                  1 ,44
                  0 ,88
```

arithmétique de l'oidi ($\mathbb{R}$) (suite)

1. e) 182,5625

182	2
91	0
45	1
22	1
11	0
5	1
2	1
1	0
0	1

2 × 0,5625
	1	, 125
↓	0	, 25
	0	, 5
↑	1	, 0

10110110,1001

$1,0110110 1001 \times 10_2^7$

0 | 10000110 | 0110110100100000000...$_\infty$

#d)

f) 320,05

320	2
160	0
80	0
40	0
20	0
10	0
5	0
2	1
1	0
0	1

2 × 0,05
0	, 1
0	, 2
0	, 4
0	, 8
1	, 6
1	, 2

101000000,0000$\overline{11}$

$1,01000000000011 \times 10^8$

127 = 01111111
+ 8 = 00001000
10000111

0 | 10000111 | 01000000000011001100110

2. a) exposant : 10000010   00000101 = 5
   − 01111111
   00000101

mantisse : 1101 = $2^{-1}+2^{-2}+2^{-4}$ = 0,5 + 0,25 + 0,0625 = 0,8125
   + 1,8125 × 2^5 = 58

b) exposant : 10000110
   − 01111111
   111 = 7

mantisse : 00100010010 = $2^{-3} + 2^{-7} + 2^{-9}$ = 0,125 + 0,0078125 + 0,001953125
   = 0,134765625
   − 1,134765625 × 2^7 = −145,25

c) exposant : 0111 0111 = $2^0+2^1+2^2+2^4+2^5+2^6$ = 119 − 127 = −8
   mantisse : 01000111101011100001010 = 0,2800000906
   + 1,28 00000906 × 2^{-8} = 0,005

d) exposant : $\cancel{1000}1011$
     $\underline{0111111\,1}$
           $1100 \rightarrow 12$

  mantisse : 0
       $-1,0 \times 2^{12} = -4096$

3. a) 0100   0010   0110   1000   0000   0000   0000   0000
         4   2   6   8   0   0   0   0

   b) 1100   0011   0001   0001   0100   0000   0000   0000
         C   3   1   1   4   0   0   0

   c) 0011   1011   1010   0011   1101   0111   0000   1010
         3   B   A   3   D   7   0   A

   d) 1100   0101   1000
         C   5   8   0   0   0   0   0