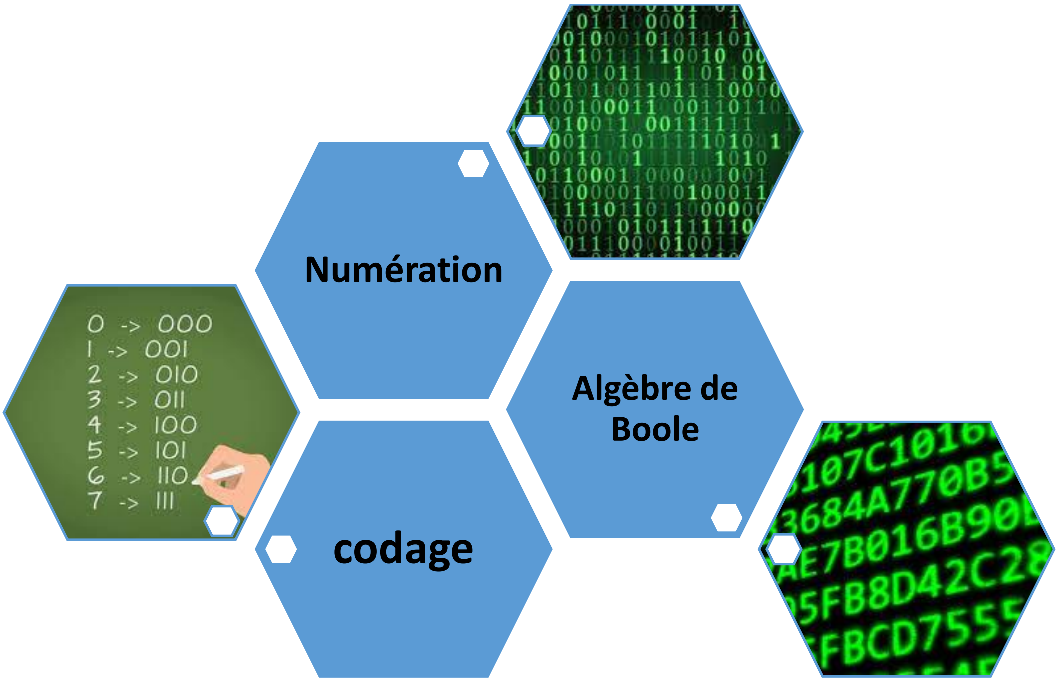
REPUBLIQUE ALGERIENNE DEMOCRATIQUE ET POPULAIRE
Ministère de l'Enseignement Supérieure et de la Recherche Scientifique
Université Djilali Bounaâma de Khemis Miliana
Faculté des sciences et techniques
Département de maths et informatique
Niveau : Licence 1ère année MI

Solution de la série de TD N°1

(Systèmes de Numération)



Exercice N°1 :

1. Tableau de correspondance des 25 premiers nombres entiers dans les bases suivantes : 2, 5, 6, 8, 11 et 16.

Base 10	Base 2	Base 5	Base 7	Base 8	Base 12	Base 16
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	10	2	2	2	2	2
3	11	3	3	3	3	3
4	100	4	4	4	4	4
5	101	10	5	5	5	5
6	110	11	6	6	6	6
7	111	12	10	7	7	7
8	1000	13	11	10	8	8
9	1001	14	12	11	9	9
10	1010	20	13	12	A	A
11	1011	21	14	13	10	B
12	1100	22	15	14	11	C
13	1101	23	16	15	12	D
14	1110	24	20	16	13	E
15	1111	30	21	17	14	F
16	10000	31	22	20	15	10
17	10001	32	23	21	16	11
18	10010	33	24	22	17	12
19	10011	34	25	23	18	13
20	10100	40	26	24	19	14
21	10101	41	30	25	1A	15
22	10110	42	31	26	20	16
23	10111	43	32	27	21	17
24	11000	44	33	30	22	18

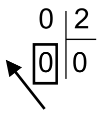
2. Les représentations en binaire (base 2), en octal (base 8) et puis en hexadécimal (base 16) des nombres décimaux suivants : $(0)_{10}$, $(11)_{10}$, $(255)_{10}$, $(34,125)_{10}$, $(13,6)_{10}$, $(54,18)_{10}$

➦ $(0)_{10}$

$(0)_{10} = (0)_2$

$= (0)_8$

$= (0)_{16}$

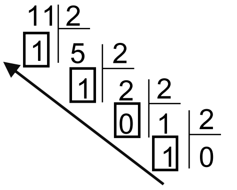


➦ $(11)_{10}$

$(11)_{10} = (1011)_2$

$=(\underline{001}\ \underline{011})_2 = (13)_8$

$=(\underline{1011})_2 = (B)_{16}$

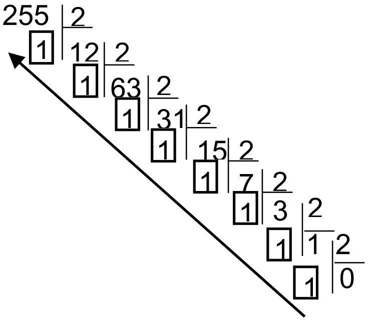


➦ $(255)_{10}$

$(255)_{10} = (11111111)_2$

$=(\underline{011}\ \underline{111}\ \underline{111})_2 = (377)_8$

$=(\underline{1111}\ \underline{1111})_2 = (FF)_{16}$



➦ $(34{,}125)_{10}$

$(34{,}125)_{10} = (100010{,}001)_2$

$=(\underline{100}\ \underline{010}{,}\underline{001})_2 = (42{,}1)_8$

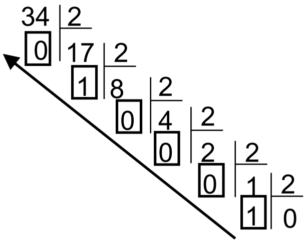
$=(\underline{0010}\ \underline{0010}{,}\underline{0010})_2$

$=(22{,}2)_{16}$

$0{,}125*2=\boxed{0}{,}25$

$0{,}25*2=\boxed{0}{,}5$

$0{,}5*2=\boxed{1}{,}0$



➦ $(13{,}6)_{10}$

$(13{,}6)_{10} = (1101{,}100110011001....)_2$

$=(\underline{001}\ \underline{101}{,}\underline{100}\ \underline{110}\ \underline{011}\ \underline{001}...)_2$

$=(15{,}4631..)_8$

$=(\underline{1101}{,}\underline{1001}\ \underline{1001}\ \underline{1001}....)_2$

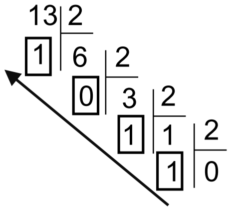
$=(D{,}999...)_{16}$

$0{,}6*2=\boxed{1}{,}2$

$0{,}2*2=\boxed{0}{,}4$

$0{,}4*2=\boxed{0}{,}8$

$0{,}8*2=\boxed{1}{,}6$



➦ $(54{,}18)_{10}$

$(54{,}18)_{10} = (110110{,}001011100001......)_2$

$=(\underline{110}\ \underline{110}{,}\underline{001}\ \underline{011}\ \underline{100}\ \underline{001}......)_2$

$=(66{,}1341....)_8$

$=(\underline{0011}\ \underline{0110}{,}\underline{0010}\ \underline{1110}\ \underline{0001}......)_2$

$=(36{,}2E1.....)_{16}$

$0{,}18*2=\boxed{0}.36$

$0{,}36*2=\boxed{0}{,}72$

$0{,}72*2=\boxed{1}{,}44$

$0{,}44*2=\boxed{0}{,}88$

$0{,}88*2=\boxed{1}.76$

$0{,}76*2=\boxed{1}{,}52$

$0{,}52*2=\boxed{1}{,}04$

$0{,}04*2=\boxed{0}{,}08$

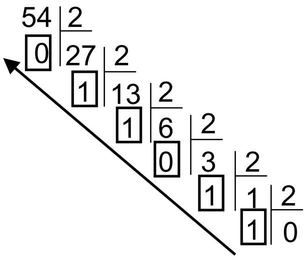
$0{,}08*2=\boxed{0}.16$

$0{,}16*2=\boxed{0}{,}32$

$0{,}32*2=\boxed{0}{,}64$

$0{,}64*2=\boxed{1}{,}28$

. . . .



3. Les équivalents décimaux des nombres suivants :

- **$(101,11)_2 = (……………………)_{10}$**

$(101,11)_2 = (?)_{10}$

$(101,11)_2 = 1*2^2 +0*2^1 +1*2^0 +1*2^{-1}+1*2^{-2}$.

$=4+1+0,5+0,25$

$= (5,75)_{10}$

- **$(10000,00)_2 = (……………………)_{10}$**

$(10000,00)_2 = (?)_{10}$

$(10000,00)_2 = 1*2^4 +0*2^3 +0*2^2 +0*2^1+0*2^0+0*2^{-1}+0*2^{-2}$.

$=16$

$= (16)_{10}$

- **$(1,1)_2 = (……………………)_{10}$**

$(1,1)_2 = (?)_{10}$

$(1,1)_2 = 1*2^0 +1*2^{-1}$.

$=1+0,5$

$= (1,5)_{10}$

- **$(1234)_8 = (……………………)_{10}$**

$(1234)_8 = (?)_{10}$

$(1234)_8 = 1*8^3 +2*8^2 +3*8^1 +4*8^0$.

$=512+128+24+4$

$= (668)_{10}$

- **$(10,132)_8 = (……………………)_{10}$**

$(10,132)_8 = (?)_{10}$

$(10,132)_8 = 1*8^1 +0*8^0 +1*8^{-1} +3*8^{-2}+2*8^{-3}$.

$=8+0,125+0,046875+0,00390625$

$= (8,17578125)_{10}$

- **$(111,11)_8 = (……………………)_{10}$**

$(111,11)_8 = (?)_{10}$

$(111,11)_8 = 1*8^2 +1*8^1 +1*8^0 +1*8^{-1}+1*8^{-2}$

$=64+8+1+0.125+0,015625$

$= (73,140625)_{10}$

➦ **$(A04,12)_{16} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{10}$**

$(A04,12)_{16} = (?)_{10}$

$(A04,12)_{16} = A*16^{2} +0*16^{1} +4*16^{0} +1*16^{-1}+2*16^{-2}$

$= 10*16^{2} +0*16^{1} +4*16^{0} +1*16^{-1}+2*16^{-2}$

$= 2560+4+0,0625+0,0078125$

$= (2564,0703125)_{10}$

➦ **$(BAC23)_{16} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{10}$**

$(BAC23)_{16} = (?)_{10}$

$(BAC23)_{16} = B*16^{4} +A*16^{3} +C*16^{2} +2*16^{1}+3*16^{0}.$

$= 11*16^{4} +10*16^{3} +12*16^{2} +2*16^{1}+3*16^{0}$

$= 720896+40960+3072+32+3$

$= (764963)_{10}$

4. Représentation directe et sans passer par la procédure de division les nombres suivants en base 2:

➦ **$X=(1320)_{4} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{2}$**

$X=(1320)_{4}$

$= (01\ 11\ 10\ 00)_{2}$

$= (1111000)_{2}$

➦ **$Y=(307,5)_{8} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{2}$**

$Y=(307,5)_{8}$

$= (011\ 000\ 111,101)_{2}$

$= (11000111,101)_{2}$

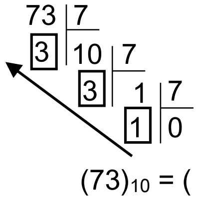
➦ **$Z=(BAC,BEF)_{16} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{2}$**

$Z=(BAC,BEF)_{16}$

$= (1011\ 1010\ 1100,1011\ 1110\ 1111)_{2}$

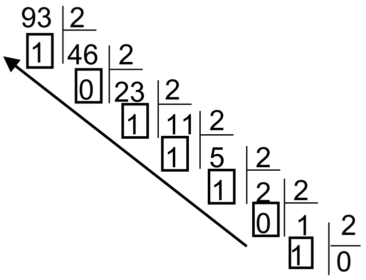
Exercice N°2 :

➦ **$(73)_{10} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{7}$**



$(73)_{10} = (\ 133)_{7}$

➦ **$(93{,}625)_{10}$ = (…………………….)$_2$**



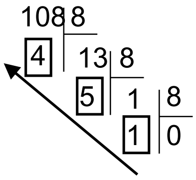
$0{,}625*2=\boxed{1},25$

$0{,}25*2 \ =\boxed{0},5$

$0{,}5*2 \ \ =\boxed{1},0$

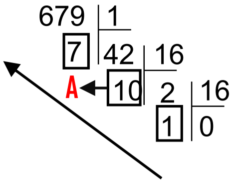
$(93{,}625)_{10} = (1011101{,}101)_2$

➦ **$(108)_{10}$ = (………………….)$_8$**



$(108)_{10} = (154)_8$

➦ **$(679{,}93359375)_{10}$ = (…………………….)$_{16}$**



$0{,}93359375*16= \boxed{14},9375 \rightarrow E$

$0{,}9375*16 \quad = \boxed{15},0 \longrightarrow F$

$(679{,}93359375)_{10} = (1A7{,}EF)_{16}$

➦ **$(4103)_5$ = (…………………….)$_{10}$**

$(4103)_5 = (?)_{10}$

$(4103)_5 = 4*5^3 +1*5^2 +0*5^1 +3*5^0$.

=500+25+3

= $(528)_{10}$

➦ **$(31121{,}232)_4$ = (…………………….)$_{10}$**

$(31121{,}232)_4 = (?)_{10}$

$(31121{,}232)_4 = 3*4^4 +1*4^3 +1*4^2 +2*4^1 +1*4^0 +2*4^{-1} +3*4^{-2}+2*4^{-3}$.

=786+64+16+8+1+0,5+0,1875+0,03125

= $(875{,}71875)_{10}$

➦ **$(2034)_5=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_9$**

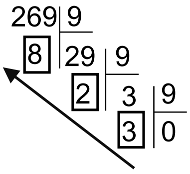
$(2034)_5=(\ ?)_9$

$(2034)_5=(\ ?)_{10}$

$(2034)_5=2*5^3+0*5^2+3*5^1+4*5^0$

$=(269)_{10}$

$(269)_{10}=(\ ?)_9$



$(2034)_5=(269)_{10}$

$(269)_{10}=(328)_9$

$(2034)_5=(328)_9$

➦ **$(1023,02)_4=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_6$**

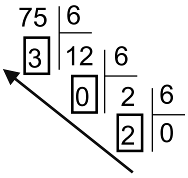
$(1023,02)_4=(\ ?)_6$

$(1023,02)_4=(\ ?)_{10}$

$(1023,02)_4=1*4^3+0*4^2+2*4^1+3*4^0+0*4^{-1}+2*4^{-2}$

$=(75,125)_{10}$

$(75,125)_{10}=(\ ?)_6$



$(1023,02)_4=(75,125)_{10}$

$0,125*6=\boxed{0},75$

$0,75*6\ =\boxed{4},5$

$0,5*6\ \ =\boxed{3},0$

$(75,125)_{10}=(203,043)_6$

$(1023,02)_4=(203,043)_6$

➦ **$(104,2)_5=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_6$**

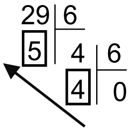
$(104,2)_5=(\ ?)_6$

$(104,2)_5=(\ ?)_{10}$

$(29,4)_{10}=(\ ?)_6$

$(104,2)_5=1*5^2+0*5^1+4*5^0+2*5^{-1}$

$=(29,4)_{10}$



$0,4*6=\boxed{2},4$

$(104,2)_5=(29,4)_{10}$

$(29,4)_{10}=(54,222\ldots..)_6$

$(104,2)_5=(54,222\ldots\ldots)_6$

➦ **$(10111000,101)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_4$**

$(10111000,101)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_4$

$(10111000,101)_2=(\underline{10}\ \underline{11}\ \underline{10}\ \underline{00},\underline{10}\ \underline{10})_2$

$=(2320,22)_4$

➦ **$(10110101101,11011)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_8$**

$(10110101101,11011)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_8$

$(10110101101,11011)_2=(\underline{010}\ \underline{110}\ \underline{101}\ \underline{101},\underline{110}\ \underline{110})_2$

$=(2655,66)_8$

➦ **$(100101011100,011101)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{16}$**

$(100101011100,011101)_2=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_{16}$

$(100101011100,011101)_2=(\underline{1001}\ \underline{0101}\ \underline{1100},\underline{0111}\ \underline{0100})_2$

$=(95C,74)_{16}$

➦ **$(135,04)_8=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_2$**

$(135,04)_8=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_2$

$(135,04)_8=(\underline{001}\ \underline{011}\ \underline{101},\underline{000}\ \underline{100})_2$

$=(1011101,0001)_2$

➦ **$(A6C,01E)_{16}=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_2$**

$(A6C,01E)_{16}=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_2$

$(A6C,01E)_{16}=(\underline{1010}\ \underline{0110}\ \underline{1100},\ \underline{0000}\ \underline{0001}\ \underline{1110})_2$

$=(101001101100,00000001111)_2$

➦ **$(F92A,20F)_{16}=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_8$**

$(F92A,20F)_{16}=(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_8$

$(F92A,20F)_{16}=(1111\ 1001\ 0010\ 1010,0010\ 0000\ 1111)_2$

$=(\underline{001}\ \underline{111}\ \underline{100}\ \underline{100}\ \underline{101}\ \underline{010},\underline{001}\ \underline{000}\ \underline{001}\ \underline{111})_2$

$=(174452,1017)_8$

➦ **$(11010110101,01011)_2=(\ldots\ldots\ldots\ldots)_4=(\ldots\ldots\ldots)_8=(\ldots\ldots\ldots\ldots)_{16}$**

$(11010110101,01011)_2=(\ldots\ldots\ldots\ldots)_4=(\ldots\ldots\ldots)_8=(\ldots\ldots\ldots\ldots)_{16}$

$(11010110101,01011)_2=(01\ 10\ 10\ 11\ 01\ 01,01\ 01\ 10)_2=(122311,112)_4$

$=(011\ 010\ 110\ 101,010\ 110)_2=(3265,26)_8$

$=(0110\ 1011\ 0101,0101\ 1000)_2=(6B5,58)_{16}$

Exercice N°3 :

1. Les nombres qui ont la même représentation en binaire, en octal, en hexadécimal et en décimal sont : $\{0,1\}$

2. Les nombres qui ont la même représentation en octal, en hexadécimal et en décimal sont : $\{0,1,2,3,4,5,6,7\}$

3. Les nombres qui ont un sens en hexadécimal sont : BAC- CAFE- BAFFE- DECADE- BEF - FA5D-F00D-C0DE- A1DE.

4. Le nombre des entiers positifs qui on peut exprimer avec n chiffres dans une base b est : B^n

Exercice N°4 :

1. Détermination des bases (X,Y,Z et W) dans lesquelles les nombres suivants sont exprimés:

➦ $(24)_X = (14)_{10}$

$(24)_X = (14)_{10} \Rightarrow 2*X^1+4*X^0=14$
$\Rightarrow 2X+4=14$
$\Rightarrow X=(14-4)/2$
$\Rightarrow X=5$

➦ $(13)_Y = (7)_{10}$

$(13)_Y = (7)_{10} \Rightarrow 1*Y^1+3*Y^0=7$
$\Rightarrow Y+3=7$
$\Rightarrow Y=7-3$
$\Rightarrow Y=4$

➦ $(70)_Z = (56)_{10}$

$(70)_Z = (56)_{10} \Rightarrow 7*Z^1+0*Z^0=56$
$\Rightarrow 7Z=56$
$\Rightarrow Z=56/7$
$\Rightarrow Z=8$

➦ $(1A0)_W = (416)_{10}$

$(1A0)_W = (416)_{10} \Rightarrow 1*W^2+A*W^1+0*W^0=416$
$\Rightarrow W^2+10W=416$
$\Rightarrow W^2+10W-416=0$

$$\begin{aligned} \Delta &= \mathrm{B}^2 - 4\mathrm{AC} \\ &= 10^2 - 4*1*(-416) \\ &= 1764 \quad \Rightarrow \sqrt{\Delta} = 42 \end{aligned}$$

$$\begin{cases} \mathrm{W}_1 = \dfrac{-B+\sqrt{\Delta}}{2A} = \dfrac{-10+42}{2} = 16 \in \mathrm{N} \\ \mathrm{W}_2 = \dfrac{-B-\sqrt{\Delta}}{2A} = \dfrac{-10-42}{2} = -26 \notin \mathrm{N} \end{cases} \qquad \Rightarrow W = 16$$

2. Détermination des entiers (X, Y) tel que : $(XY)_7 = (YX)_{10}$:

$(XY)_7 = (YX)_{10} \Rightarrow X*7^1+Y*7^0=Y*10^1+X*10^0$
$\Rightarrow 7X+Y=10Y+X$
$\Rightarrow 10Y-Y=7X-X$
$\Rightarrow 9Y=6X$
$\Rightarrow Y=\frac{6}{9}X$
$\Rightarrow Y=\frac{2}{3}X$

En plus (XY) c'est un nombre dans la base 7, c'est-à-dire donc 0<X<7 et 0<Y<7, alors :

$$\begin{cases} \text{si} \quad X = 0 \in N \Rightarrow Y = 0 \in N \\ \text{si} \quad X = 1 \in N \Rightarrow Y = \frac{2}{3} \notin N \\ \text{si} \quad X = 2 \in N \Rightarrow Y = \frac{4}{3} \notin N \\ \text{si} \quad X = 3 \in N \Rightarrow Y = 2 \in N \\ \text{si} \quad X = 4 \in N \Rightarrow Y = \frac{8}{3} \notin N \\ \text{si} \quad X = 5 \in N \Rightarrow Y = \frac{10}{3} \notin N \\ \text{si} \quad X = 6 \in N \Rightarrow Y = 4 \in N \end{cases} \Rightarrow \text{donc il existe trois solutions sont :} \begin{cases} X = 0 \text{ et } Y = 0 \\ X = 3 \text{ et } Y = 2 \\ X = 6 \text{ et } Y = 2 \end{cases}$$

3. Représentation des nombres décimaux en base a :

X= $(4a^5+2a^3+a+5)_{10}$
=(402015)a

Y= $(a)_{10}$
=(10)a

Z= $(a^2)_{10}$
=(100)a

W= $(a^3)_{10}$
=(1000)a

Exercice N°5:

➦ $(1001110,11)_2 + (11011,101)_2 =$ $(\ldots\ldots\ldots)_2$

➦ $(11011,101)_2 + (10111,111)_2 =$ $(\ldots\ldots\ldots)_2$

$$\left(\begin{array}{rr} & {\scriptstyle 1\,1\,1\,1\,1\,1} \\ & 1001110,110 \\ + & 11011,101 \\ \hline = & 1101010,011 \\ & \\ & \end{array}\right)_2 \qquad \left(\begin{array}{r} {\scriptstyle 11\;1\,11\;\;1\,1} \\ 11011,101 \\ +\ 10111,111 \\ \hline =110011,100 \\ \\ \end{array}\right)_2$$

$(1001110,11)_2 + (11011,101)_2 = (1101010,011)_2$ $(11011,101)_2 + (10111,111)_2 = (110011,100)_2$

- ➦ $(1110{,}011)_2 + (1101{,}11)_2 + (1110{,}111)_2 = (\ldots\ldots)_2$

$$\left(\begin{array}{rr} & {\scriptstyle 10\ 1\ 1\ 10\ \ 101} \\ & 1110{,}011 \\ + & 1101{,}110 \\ + & 1110{,}111 \\ \hline = & 101011{,}000 \end{array}\right)_2$$

$$(1110{,}011)_2 + (1101{,}11)_2 + (1110{,}111)_2 = (101011)_2$$

- ➦ $(101001{,}001)_2 - (11111{,}11)_2 = (\ldots\ldots\ldots)_2$

$$\left(\begin{array}{rr} & 1_1 0_1 1_1 0_1 0_1 1,\ {}_1 0_1 01 \\ - & {}_1\,{}_1 1_1 1_1 1_1 1_1 1,\ {}_1 1\ 10 \\ \hline = & 0\ 0\ 1\ 0\ 0\ 1,\ 0\ \ 1\ 1 \end{array}\right)_2$$

$$(101001{,}001)_2 - (11111{,}11)_2 = (1001{,}011)_2$$

- ➦ $(1011{,}011)_2 * (110)_2 = (\ldots\ldots\ldots\ldots\ldots\ldots)_2$

$$\left(\begin{array}{rr} & 1011{,}011 \\ * & 110 \\ \hline = & 0000000 \\ + & 1011011\bullet \\ + & 1011011\bullet\bullet \\ \hline = & 1000100{,}010 \end{array}\right)_2$$

$$(1011{,}011)_2 * (110)_2 = (1000100{,}01)_2$$

- ➦ $(1001001{,}11)_2 / (101)_2 = (\ldots\ldots\ldots\ldots\ldots..)_2$

$$\left(\begin{array}{l|l} 1001001{,}11 & 101 \\ \cline{2-2} -\ 101 & 1110{,}11 \\ \cline{1-1} =1001 & \\ \quad -\ 101 & \\ \cline{1-1} \quad =\ 0110 & \\ \qquad -\ 101 & \\ \cline{1-1} \qquad =\ 0011 & \\ \qquad\quad -\ 000 & \\ \cline{1-1} \qquad\quad =\ 0111 & \\ \qquad\qquad -101 & \\ \cline{1-1} \qquad\qquad =\ 0101 & \\ \qquad\qquad\quad -101 & \\ \cline{1-1} \qquad\qquad\quad =000 & \end{array}\right)_2$$

$$(1001001{,}11)_2 \div (101)_2 = (1110{,}11)_2$$

- ➦ $(73{,}7)_8 + (65{,}3)_8 = (\ldots\ldots\ldots\ldots\ldots..)_8$

$$\left(\begin{array}{rr} & {\scriptstyle 1\,1}\ \ \ \ \\ & 73{,}7 \\ + & 65{,}3 \\ \hline = & 161{,}2 \end{array}\right)_8$$

$$(73{,}7)_8 + (65{,}3)_8 = (161{,}2)_8$$

- ➦ $(531)_8 - (167)_8 = (\ldots\ldots\ldots\ldots\ldots..)_8$

$$\left(\begin{array}{rr} & 5_1 3_1 1 \\ - & {}_1 1_1 67 \\ \hline = & 3\ 4\ 2 \end{array}\right)_8$$

$$(531)_8 - (167)_8 = (342)_8$$

➦ $(26,5)_8$ x $(4,3)_8$ =(……………..)$_8$

$$\left(\begin{array}{rr} & {}^{3\,2} \\ & {}^{2\,1} \\ & 26{,}5 \\ * & 4{,}3 \\ \hline = & 7\,37 \\ + & 132\,2\bullet \\ \hline = & 141{,}57 \end{array}\right)_8$$

$$(26{,}5)_8 * (4{,}3)_8 = (141{,}57)_8$$

➦ $(31,7)_8$ x$(52)_8$ =(……………..)$_8$

$$\left(\begin{array}{rr} & {}^{1\,4} \\ & {}^{1} \\ & 31{,}7 \\ * & 52 \\ \hline = & 636 \\ + & 2013\bullet \\ \hline = & 2076{,}6 \end{array}\right)_8$$

$$(31{,}7)_8 * (52)_8 = (2076{,}6)_8$$

➦ $(C3E)_{16}$ +$(6AD)_{16}$=(……………..)$_{16}$

$$\left(\begin{array}{rr} & {}^{1} \\ & \mathrm{C3E} \\ + & \mathrm{6AD} \\ \hline = & \mathrm{12EB} \end{array}\right)_{16}$$

$$(\mathrm{C3E})_{16} + (\mathrm{6AD})_{16} = (\mathrm{12EB})_{16}$$

➦ $(E31)_{16}$-$(6EC)_{16}$=(……………..)$_{16}$

$$\left(\begin{array}{rr} & \mathrm{E}{}_{1}3{}_{1}1 \\ - & {}_{1}6{}_{1}\mathrm{EC} \\ \hline = & 7\;4\;5 \end{array}\right)_{16}$$

$$(\mathrm{E31})_{16} - (\mathrm{6EC})_{16} = (745)_{16}$$