$a \cdot b \oplus a \cdot c \oplus b \cdot c \rightarrow a \cdot b + a \cdot c + b \cdot c$

$I_1: (a \oplus b) \cdot c = a \cdot c \oplus b \cdot c$

$I_2: a + b = a \oplus b \oplus a \cdot b$

$I_2': a \oplus b = (a + b) \oplus a \cdot b$

$x \oplus y = x \cdot \bar{y} + \bar{x} \cdot y$

$a \cdot b \oplus a \cdot c \oplus b \cdot c = (a \cdot b \oplus a \cdot c) \oplus b \cdot c$

$= ((a \cdot b \oplus a \cdot c) + b \cdot c) \oplus (a \cdot b \oplus a \cdot c) \cdot b \cdot c$

$= ((a \cdot b + a \cdot c) \oplus \overline{a \cdot b \cdot a \cdot c} + b \cdot c) \oplus (\overline{a \cdot b} \cdot \overline{b \cdot c} \oplus a \cdot \overline{c \cdot b \cdot c})$

$= ((a \cdot b + a \cdot c) \oplus a \cdot b \cdot c + b \cdot c) \oplus (\underbrace{a \cdot b \cdot c \oplus a b \cdot c}_{=0}) =$

$= \overline{(a \cdot b + a \cdot c) \oplus a b \cdot c} + b \cdot c =$

$(a \cdot b \oplus a \cdot c) + b \cdot c + a \cdot b \cdot c =$

$\downarrow I_1$

$a \cdot (b \oplus c) + a \cdot b \cdot c + b \cdot c =$

$b \cdot c + a \cdot b \cdot c = (\underbrace{1 + a}_{=1}) \cdot b \cdot c$

$= a(b \oplus c + bc) + b \cdot c =$

$= a(b\bar{c} + \bar{b}c + bc) + b \cdot c =$

$= a(b\bar{c} + bc + \bar{b}c + bc) + b \cdot c =$

$= a(\underbrace{b(\bar{c} + c)}_{=1} + \underbrace{(\bar{b} + b)}_{=1} c) + b \cdot c =$

$= a(b + c) + b \cdot c = a \cdot b + a \cdot c + b \cdot c$

X, Y − IEEE 754. 1-sign; 3-expont ; 4-significat
↳ bias = $2^{3-1}-1=3$ ↳ 3-parte fract. a sign.

$X = 0.5625 = +1.001 * 2^{-1}$ $X_E = -1 + bias = 2$

$Y = -3.75 = -1.111 * 2^{+1}$ $Y_E = +1 + bias = 4$

sign ; significand.

$A_{SM} = 0 ; 1.001_{SM} = 01001_{C2}$ $E_1 = 2$

$M_{SM} = 1 ; 1.111_{SM} = 10001_{C2}$ $E_2 = 4$

$E := E_1 - E_2 = -2$

A := ARShift (A)

A := 0001001

A + M:

A = 00010	01	+
M = 10001		
A = 0 1 0011	01	

cart → mantisa is negative.

$E = max(E_1, E_2) = 4$

$A_M = 1 | 0011 | 01_{C2} \Rightarrow 1 | 1100 | 11_{SM}$

sign; mantisa, unsigned

Resultat $= -1.10011 * 2^{E-bias} =$

$= -1.10011 * 2^1 = -11.0011 = -3.1875$

$0.0011 = 11_{(2)} * 2^{-4} = \frac{11_{(2)}}{16} = \frac{3}{16} = 0.1875$

==

$0.5625 - 3.75 = -3.1875$

$Y = 0.5625 = +1.001 \times 2^{-1}$ $\quad Y_E = 2$ $\quad E_{max} = 2^3 - 1 - 1 = 6.$

$X = +3.75 = +1.111 \times 2^{+1}$ $\quad X_E = 4.$

$A = 0 \mid 1.111$ $\quad E_1 = 4$

$M = 0 \mid 1.001$ $\quad E_2 = 2$

$E = E_1 - E_2 = 2 \to M \gg 2.$

$M = 0 \mid 0.010 \mid 01$

sign

A+M

A:	0	1	1	1	1				
M:	0	0	0	1	0	0	1	+	
0	1	0	0	0	1	0	1		

$E := \max(E_1, E_2) = 4.$

cout

$A_{COUT} = 1$ (from sign bit)

sign

$A = 0 \; 1.000 \; 101$, $\quad E := 5.$

Rezultat: $+1.000101 \times 2^{E-bias} =$

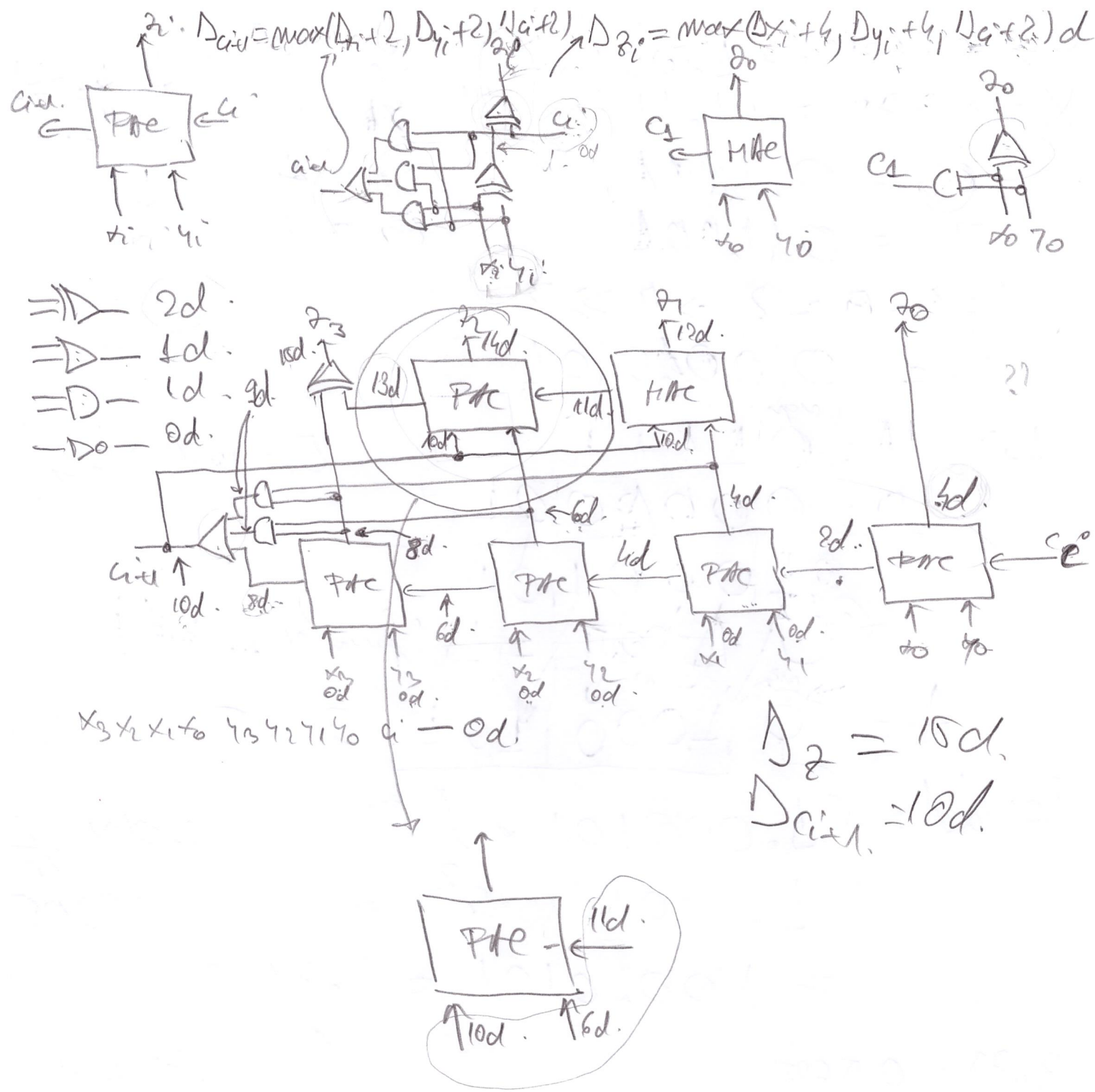
$1.000101 \times 2^2 =$

$= 100.0101 = 4.3125$

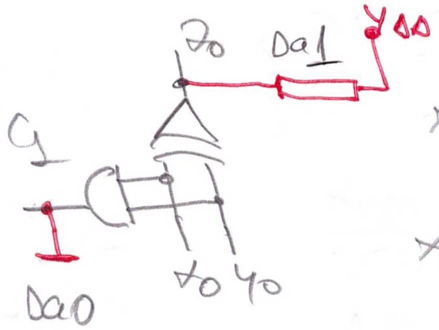
$0.0101 = \frac{5}{16} = 0.3125$

$3.75 + 0.5625$

$$\begin{array}{r} 3.7500 + \\ 0.5625 \\ \hline 4.3125 \end{array}$$


PFC
HFC
2d
4d
1d
0d
$x_3 x_2 x_1 x_0$ $y_3 y_2 y_1 y_0$ c_i — 0d.
$D_z = 15d.$
$D_{c_{i+1}} = 10d.$

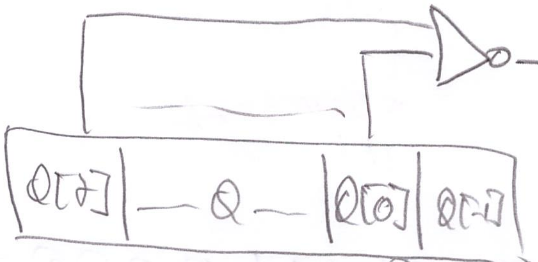
MHe:



$x_0, y_0 = 0,1 \Rightarrow z_0 = 1$, $c_1 = 0$

$x_0, y_0 = 1,1 \Rightarrow z_0 = 0\ (1)$, $c_1 = 1\ (0)$

X == 0



[-16; 15]

[-4 ; 3]

INPUT: M := INBUS → {c0}.

Q[7:0] := INBUS[7:0], Q[-1] := 0; → {c1}.

TESTQIS0: if Q_is_0 == 1 then goto . . . . . .

TESTA: if Q[0]Q[-1] == 01 then A := A+M, goto TESTZ; ...

Rezolvare 1 întrebări: X = 12   Y = -3

$X = 01100_{C2}$

$Y = 111_{SM} = 101_{C2}$

F	A	Q	M	COUNT
0	000		101	000
		01100		
	000	00110		001
	000	00011		010
+	101			
	101			
1	110	10001		011
+	101			
1	011			
	101	11000		100 COUNT4 == 1
	110	11100		

and / or

COUNT_MAX = 4

COUNTMAX = n biti magnitudine of X

Integer Arithmetic RShift

$P = 11011100_{C2} = 10100100_{SM} = -(32+4) = -36$ ✓

5 4 3 2 1 0

$X = 0.25 = 0.010_{SM} = 0.010_{C2}$

$Y = -0.5 = 1.100_{SM} = 1.100_{C2}$

$\frac{0.25 * (-1.5)}{2}$

A	Q	n	COUNT
0000	00100	1100	00
↓	↓		01
0000	00010		
−1100			
0100			
0010	00001		10
+1100			
1110			← COUNT 3 ⇒ 1
1111	00000		11
1111	0000		

$P = 1.1111\,0000_{C2} =$

$= 1.0001\,0000_{SM}$

$\xrightarrow{MQR} -0001_0 * 2^{-3} = -\frac{1}{8} = -0.125$

$1001.0000 = 1001$

$0.25 * (-1.5)$

$-1.5 = -1.1_{(2)}$

$-1.5 = -0.75 * 2$

$P = [0.25 * (-0.75)] * 2$

$-0.25 * 0.5 =$

$= -\frac{25 * 5}{1000} = 2$

$= -\frac{125}{1000} = -0.125$