Aufgabe 19

Samstag, 26. November 2022 22:49

a)

1) $17.5 = 8{,}75 \cdot 2^1 = 4{,}375 \cdot 2^2 = 2{,}1875 \cdot 2^3 = 1{,}09375 \cdot 2^4$

2) $0.021 = 0{,}042 \cdot 2^{-1} = 0{,}084 \cdot 2^{-2} = 0{,}168 \cdot 2^{-3} = 0{,}336 \cdot 2^{-4} = 0{,}672 \cdot 2^{-5} = 1{,}344 \cdot 2^{-6}$

b)

1) $c_{GK,11,16}(0.3)$

$0{,}3 = 0{,}6 \cdot 2^{-1} = 1{,}2 \cdot 2^{-2}$

Vorzeichen: 0 $\Rightarrow$ Positiv

$q = 2^{16-11-1} - 1 = 2^4 = 15$

$c_{EX-15,5}(-2) = c_{2,5}(-2+15) = c_{2,5}(13) = 01101$

$c_{FIK_{10,10}}(0{,}2) = c_{2,10}(\mathrm{rd}(0{,}2 \cdot 2^9)) = c_{2,10}(205) = 0011001101$

0	01101	0011001101
Vz.	Ch.	M.

2) $(0\ 01101\ 0011001101)_{GK,11,16}$

$q = 2^{16-11-1} - 1 = 2^4 = 15$

$(01101)_{EX-15,5} = c_{4,5}(13-15) = c_{2,5}(-2)$

$m = (0011001101)_{FIK,10,10} + 1 = c_{2,10}(205) + 1 = c_{FIK\,10,10}\left(\frac{205}{2^{10}}\right) + 1 = 0{,}2 + 1 = \underline{1{,}2}$

$\Rightarrow 1{,}2 \cdot 2^{-2} = 0{,}3$

3)

$c_{GK-10,16}(0{,}3)$

$0{,}3 = 1{,}2 \cdot 2^{-2}$

$n-k = 16-10 = 6$

$q = 2^{6-1} - 1 = 2^5 - 1 = 31$

$C_{EX-31,6}(-2) = C_{2,6}(-2+31) =$

$= C_{2,6}(29) = (011101)_2$

$C_{FIK-9,9}(1,2-1) = C_{FIK-9,9}(0,2) := C_{2,9}(0,2 \cdot 2^9) = C_{2,9}(102) = (001100110)_{2,9}$

$\Rightarrow 0,2 \cdot 29 = rd(102,4) \Rightarrow 102$

$0,4$

4) $C_{gK,11,16}(-24)$

$-24 = -12 \cdot 2^1 = -6 \cdot 2^2 = -3 \cdot 2^3 = -1,5 \cdot 2^4$

Vorzeichen: 1 => negativ

$q = 2^{16-11-1} - 1 = 15$

$C_{EX-15,5}(4) = C_{2,5}(4+15) = C_{2,5}(19) = 10011$

$C_{FIK,10,10}(0,5) = C_{2,10}(rd(0,5 \cdot 2^{10}) = C_{2,10}(rd(512)) = 1000000000$

1	10011	1000000000

5) $(1\ 10100\ 0010010000)_{gK,11,16}$

Negativ

$q = 2^{16-11-1} - 1 = 15$

$(10100)_{EX-15,5} = C_{2,5}(20-15) = 5$

$(0010010000)_{FIK,10,10} + 1 = \left(\frac{144}{2^{10}}\right) + 1 = 1,140625$

$\Rightarrow -1,140625 \cdot 2^5 = -36,5$

6) $0\ \underbrace{0000}\ \underbrace{0000001}$ $\Rightarrow (0\ 0000\ 0000001)_{GK,11,16}$

6)

$\Rightarrow (0\ 0000\ 0000001)_{GK,11,16}$

$q = 2^{12-8-1} - 1 = 2^3 - 1 = 8 - 1 = 7$

$(0000)_{EX-7,4} = c_{2,4}(0-7) = -7$

$(00000001)_{FK-4,4} + 1 = \frac{1}{2^7} + 1 = 1,0078125$

$1,0078125 \cdot 2^{-7} = 0,007873535156 2$

7) $(0\ 11111\ 1111111110)_{GK\ 11,16}$

$q = 2^{16-11-1} - 1 = 15$

$(11111)_{EX-15,5} = c_{2,15}(31-15) = 16$

$(1111111111)_{FK,10,10} + 1 = \frac{1022}{2^{10}} + 1 = 1,99804687$

$1,99804687 \cdot 2^{16} = 130.944$