

## Aufgabe 1

$$x_1 = 0.07125 \quad x_2 = 10000 \quad x_3 = 0.2$$

a.)  $p=10$ ,  $t=7$ ,  $l_{\min}=-3$ ,  $l_{\max}=3$

$$x_1 = \underline{3.125} \cdot 10^{-2}$$

round to even

$$fl(x_1) = 3.12 \cdot 10^{-2}$$

$$x_2 = 1.0 \cdot 10^4 \quad 4 > l_{\max}$$

$\Rightarrow$  overflow

$$fl(x_2) = \infty$$

$$x_3 = 2.0 \cdot 10^{-1}$$

$$fl(x_3) = 2.00 \cdot 10^{-1} = x_3$$

1. in System zu Basis  $\beta$   
umrechnen

2. Normieren

3. Exponent prüfen

4. Mantisse anpassen, ggf.  
runden

$$b) \beta=2, t=53, l_{\min} = -102, l_{\max} = 1023$$

$$x_1 = 0.03125 = \frac{1}{32} = 2^{-5} = 1.0 \cdot 2^{-5} \Rightarrow \mu(x_1) = t_1$$

$$x_2 = 10000$$

$$= 100111100010000_2$$

$$= 1.0011100010000 \cdot 2^{+13}$$

$$\mu(x_2) = x_2$$

$$x_3 = 0.2_{10} = 0.\overline{0011}_2$$

$$= 0.001100110011 \dots$$

$$= 1.\overline{1001} \cdot 2^{-3}$$

$$= 1.(1001)_{12x} \overline{1001} \cdot 1001 \cdot 2^{-3}$$

$$\mu(x_3) = 1.(1001)_{12x} 1010 \cdot 2^{-3}$$

$$10000_{10} = 10,0111,0001,0000_2$$

$$5000_{10}$$

$$2500$$

$$1250$$

$$625$$

$$312$$

$$156$$

$$78$$

$$39$$

$$19$$

$$9$$

$$4$$

$$2$$

$$1$$

$$0.2 \text{ —}$$

$$0.4$$

$$0.8$$

$$1.6$$

$$0.2 \text{ —}$$

$$\overline{0.0011}$$

$$c.) x_n = 1.0 \cdot 2^5$$

$$s = 0 \quad (\text{da } x_n > 0)$$

$$E = -5 + 1023 = 1018_{10} = 3FA_{16} = \overbrace{01111111}^{11 \text{ bit}} 1010$$

$$M = \underbrace{0 \dots 0}_5 0_2 = \underbrace{0 \dots 0}_{13} 0_{16}$$

insgesamt: 0 01111111 1010 0... - 0

3FA:00000000000000