1. Abgabe

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Annahme nach IEEE + = 0
− = 1

A1) a) $x=-320$ $b=2$ $r=4$ $s=4$

320/2 = 160 Rest 0
160/2 = 80 Rest 0
80/2 = 40 Rest 0
40/2 = 20 Rest 0
20/2 = 10 Rest 0
10/2 = 5 Rest 0
5/2 = 2 Rest 1
2/2 = 1 Rest 0
1/2 = 0 Rest 1

m = 1010/0000
e = 9 = 1001
z = − 1010 + 1001
= 1 1010 0 1001

b) $x=10$ $b=3$ $r=3$ $s=3$

10/3 = 3 Rest 1
3/3 = 1 Rest 0
1/3 = 0 Rest 1

m = 101
e = 010
z = + 101 + 010
= 0 101 0 010

c) $x=\frac{1}{3}$ $b=2$ $r=6$ $s=3$

$\frac{1}{3} \cdot 2 = \frac{2}{3}$ Rest 0

$\frac{2}{3} \cdot 2 = \frac{4}{3} = \frac{1}{3}$ Rest 1

$\frac{1}{3} \cdot 2 = \frac{2}{3}$ Rest 0

$\frac{1}{3} \cdot 2 = \frac{2}{3}$ Rest 0

$\frac{2}{3} \cdot 2 = \frac{4}{3} = \frac{1}{3}$ Rest 1

$\Rightarrow$ Periode

$m = 0,101010\,1 \approx 0,101011$

$e = 001$

$z = + 101011 - 001$

$= 0\ 101011\ 1\ 001$

d) $b = 2 \quad r = 2 \quad s = 1$

$00+0 = 0$
$01+0 = \frac{1}{4}$
$10+0 = \frac{1}{2}$
$11+0 = \frac{3}{4}$
$00+1 = 0$
$01+1 = \frac{1}{2}$
$10+1 = 1$
$11+1 = \frac{3}{2}$
$00-1 = 0$
$01-1 = \frac{1}{8}$
$10-1 = \frac{1}{4}$
$11-1 = \frac{3}{8}$
$00-0 = 0$
$01-0 = \frac{1}{2}$
$10-0 = \frac{3}{2}$
$11-0 = \frac{3}{4}$

A2 a) I $a(h) - a = ch^{\alpha}$

II $a(h/2) - a = c(h/2)^{\alpha}$

$\Rightarrow \frac{\text{I}}{\text{II}} \quad \frac{a(h)-a}{a(h/2)-a} = \frac{ch^{\alpha}}{c(h/2)^{\alpha}}$

$\Rightarrow \frac{a(h)-a}{a(h/2)-a} = \left(\frac{1}{\frac{1}{2}}\right)^{\alpha}$

$\Rightarrow \frac{a(h)-a}{a(h/2)-a} = 2^{\alpha}$

$\ln\left(\frac{a(h)-a}{a(h/2)-a}\right) = \alpha$

$\Rightarrow \frac{a(h/2)-a}{a(h/2)-a}$

$\Rightarrow \log_2\left(\left|\frac{a(h)-a}{a(h/2)-a}\right|\right) = \alpha$

$\Rightarrow \frac{1}{\log(2)} \cdot \log\left(\left|\frac{a(h)-a}{a(h/2)-a}\right|\right) = \alpha$

b)

| h | α | β |
|---|---|---|
| 2^-2 | 0.9965 | 1.9859 |
| 2^-3 | 1.0122 | 2.0000 |
| 2^-4 | 1.0349 | 2.0153 |
| 2^-5 | 1.0778 | 2.0712 |

$\Rightarrow$ Konvergenzordnung von $a(h)$ ist 1

$\Rightarrow$ " von $b(h)$ ist 2