Name	Klasse	Datum		Seite / Blatt
2. NHSA	BVKT1	6.6.11		

1.1 $D_{max} = \mathbb{R}\setminus\{2\}$; $Z(2) = 4 + 12 - 4k \overset{!}{=} 0 \iff k = 4$

$$f_4(x) = \frac{x^2+6x-16}{2(x-2)} = \frac{(x-2)(x+8)}{2(x-2)} = \frac{1}{2}x + 4$$

1.2 $x^2 + 6x - 4k = 0$; $D = 36 + 4\cdot 4k = 16k + 36 = 0 \iff k = -\frac{9}{4}$

1. Fall: $D < 0$ für $k < -\frac{9}{4}$: keine NST

2. Fall: $D = 0$ für $k = -\frac{9}{4}$: 1 dp. NST ; $x_{1/2} = \frac{-6}{2} = -3$

3. Fall: $D > 0$ für $k > -\frac{9}{4} \wedge k \neq 4$: zwei einf. NST

$$x_{1/2} = \frac{1}{2}\left(-6 \pm \sqrt{4(4k+9)}\right) = -3 \pm \sqrt{4k+9}$$

SF: $k = 4$: eine NST: $\frac{1}{2}x + 4 = 0 \iff x_1 = -8$ (einf.)

1.3 $(x^2 + 6x - 4k) : (2x - 4) = \frac{1}{2}x + 4 + \frac{16-4k}{2x-4}$

$-(x^2 - 2x)$

$8x - 4k$

$-(4x - 16)$

$16 - 4k$

Schräge As.: $y = \frac{1}{2}x + 4$

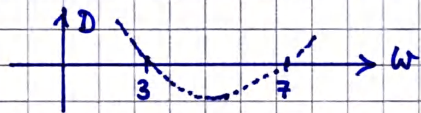
Senkr. As: $x = 2$ $(k \neq 4)$

1.4 $x^2 + 6x - 12 = 2wx - 4w \iff x^2 + (6-2w)x + 4w - 12 = 0$

$D = (6-2w)^2 - 4\cdot(4w - 12) = 36 - 24w + 4w^2 - 16w + 48$

$D = 0$: $4w^2 - 40w + 84 = 4(w^2 - 10w + 21) = 4(w-3)(w-7)$

$w_1 = 3$; $w_2 = 7$



Also: $W_f = \mathbb{R} \setminus]3;7[$

1.5 G_f und Asymptoten

Name: 2. NHSA | Klasse: BVKT1 | Datum: 6.6.11 | Seite | Blatt

2.0 $f(x) = ax^3 + bx^2 + c$

2.1

$$\begin{array}{lcccc|cccc}
P(-2/-2): & -8 & 4 & 1 & -2 & & & & \\
 & & & & & 420 & 60 & 0 & 97{,}5 \\
Q(3/6.125): & 27 & 9 & 1 & 6{,}125 & 35 & 5 & 0 & 8{,}125 \quad |\cdot 12 \\
N(-4/0): & -64 & 16 & 1 & 0 & -56 & 12 & 0 & 2 \quad |\cdot(-5) \\
 & & & & & 280 & -60 & 0 & -10
\end{array}$$

$700a = 87{,}5 \Leftrightarrow \underline{a = \frac{1}{8}}$

$-56/8 + 12b = 2 \Leftrightarrow b = \frac{1}{12}\left(2 + \frac{56}{8}\right) = \frac{9}{12} \Leftrightarrow \underline{b = \frac{3}{4}}$

$-8 \cdot \frac{1}{8} + 4 \cdot \frac{3}{4} + c = -2 \Leftrightarrow c = -2 + 1 - 3 \Leftrightarrow \underline{c = -4}$

2.2 $f(x) = 0 \quad |\cdot 8 \Rightarrow x^3 + 6x^2 - 32 = 0 \;;\; x_1 = -4$

$$\begin{array}{l}
(x^3 + 6x^2 \qquad -32) : (x+4) = x^2 + 2x - 8 = (x-2)(x+4) \\
-(x^3 + 4x^2) \\
\qquad 2x^2 \\
\qquad -(2x^2 + 8x) \\
\qquad\qquad -8x - 32 \\
\qquad\qquad -(-8x - 32) \\
\qquad\qquad\quad - \quad -
\end{array}$$

$\underline{x_2 = 2} \quad \underline{x_3 = -4}$

$\Rightarrow \underline{f(x) = \frac{1}{8}(x-2)(x+4)^2}$

2.3 $\underline{f(-3) = -\frac{5}{8}} = \underline{t(-3)} \Rightarrow$ gem. Punkt $(-3/-5/8)$

$f(x) = t(x) \Rightarrow \frac{1}{8}x^3 + \frac{3}{4}x^2 - 4 = -x - \frac{29}{8} \quad |\cdot 8$

$x^3 + 6x^2 + 8x + 25 = 0 \;;\; x_1 = -3 \;;\; (x+3)^2 = x^2 + 6x + 9$

$$\begin{array}{l}
(x^3 + 6x^2 + 8x + 25) : (x^2 + 6x + 9) = x + \ldots \\
-(x^3 + 6x^2 + 9x) \\
\hline
\qquad\qquad -x + 25
\end{array}$$

PD geht nicht auf $\Rightarrow$ <u>keine Tang.</u>

2.4 $h_a(x) = (ax)^3 + \frac{3}{4}x^2 + 2ax - x - 4$

$f(x) = \underbrace{\frac{1}{8}x^3}{} + \frac{3}{4}x^2 \qquad - 4$

$a^3 = \frac{1}{8} \Rightarrow a = \frac{1}{2}$ in $h_a(x)$

$h_{1/2}(x) = \frac{1}{8}x^3 + \frac{3}{4}x^2 + 2 \cdot \frac{1}{2}x - x - 4 = \frac{1}{8}x^3 + \frac{3}{4}x - 4 = f(x)$

$\Rightarrow$ <u>f gehört zur Schar</u>