$$f(x) = 4 - \frac{2}{3-x} \quad ; \quad D = \mathbb{R} \setminus \{3\}$$

$$W = \mathbb{R} \setminus \{4\}$$

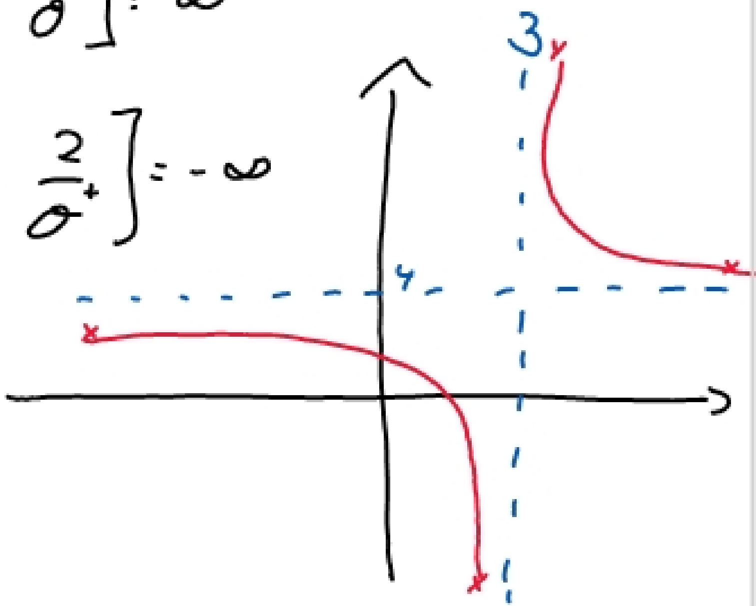
$$\frac{k}{\infty} = 0 \qquad \frac{k}{0} = \infty$$

$$\lim_{x \to \infty} f(x) = \left[4 - \frac{2}{3-\infty}\right] = \left[4 + 0^{+}\right] = 4^{+}$$

$$\lim_{x \to -\infty} f(x) = \left[4 - \frac{2}{3-(-\infty)}\right] = \left[4 + 0^{-}\right] = 4^{-}$$

$$\lim_{x \to 3^{+}} f(x) = \left[4 - \frac{2}{3-3^{+}}\right] = \left[4 - \frac{2}{0^{-}}\right] = \infty$$

$$\lim_{x \to 3^{-}} f(x) = \left[4 - \frac{2}{3-3^{-}}\right] = \left[4 - \frac{2}{0^{+}}\right] = -\infty$$



H, S.. Sel

121-128

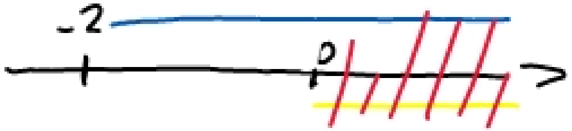
$$f(x) = \frac{3x-6}{2\cdot\sqrt{x+2} - \sqrt{8x}} \quad ; \quad D = x \in \mathbb{R}^{\geq 0} \setminus \{2\}$$

$x+2=0 \iff x=-2$

- $>$ 0 : $0+2>0$ ✓
- $<$ -10 : $-10+2<0$

$8x=0 \iff x=0$

- $>$ 10 : $8\cdot 10>0$ ✓
- $<$ -10 : $8\cdot(-10)<0$



$$
\begin{aligned}
2\sqrt{x+2} - \sqrt{8x} &= 0 && \mid +\sqrt{8x} \\
2\sqrt{x+2} &= \sqrt{8x} && \mid \uparrow^2 \\
4\cdot(x+2) &= 8x && \mid T \\
4x+8 &= 8x && \mid -4x \\
8 &= 4x && \mid \cdot \tfrac{1}{4} \\
x &= 2
\end{aligned}
$$

$$\lim_{x \to 0^+} f(x) = f(0) = \frac{-6}{2\sqrt{2} - 0} \approx -2$$

$$\lim_{x \to \infty} f(x) = \frac{x \cdot (3 - 6/x)}{x \cdot \left(\frac{2\sqrt{x+2}}{x} - \frac{\sqrt{8x}}{x} \right)} = \frac{\cancel{x} \cdot (3 - \underbrace{6/x}_{0})}{\cancel{x} \left(2 \cdot \sqrt{\underbrace{\frac{x+2}{x^2}}_{0}} - \sqrt{\underbrace{\frac{8x}{x^2}}_{0}} \right)} = \frac{3}{0} = \infty$$

$$\lim_{x \to 2} f(x) = \frac{0}{0} \to (x-2) \quad \lim \frac{g(x)}{h(x)} = \lim \frac{g'(x)}{h'(x)}$$

$$\text{NR}: \frac{3\,(x-2)}{2\sqrt{x+2} - \sqrt{8x}} \cdot \frac{2\sqrt{x+2} + \sqrt{8x}}{2\sqrt{x+2} + \sqrt{8x}} = \frac{3 \cdot \underline{(x-2)}(2\sqrt{x+2} + \sqrt{8x})}{4 \cdot (x+2) - 8x}$$

$$4x + 8 - 8x$$

$$-4x + 8$$

$$-4(\underline{x-2})$$

$$\lim_{x \to 2} \frac{3 \cdot (2\sqrt{x+2} + \sqrt{8x})}{-4} = -6$$

behebare Lücke

5) $f(x) = \frac{4}{10+2x} + 2$

$D = x \in \mathbb{R} \setminus \{-5\}$

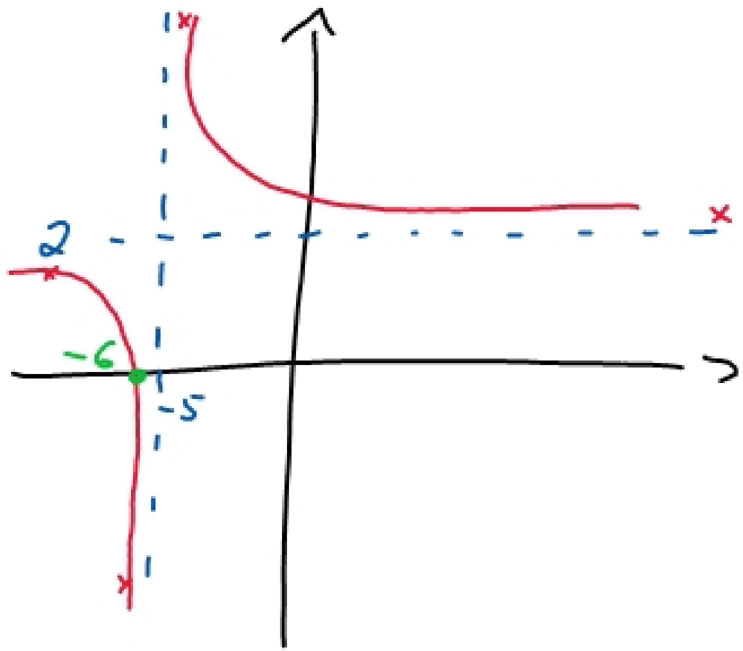
$K = y \in \mathbb{R} \setminus \{2\}$

$\lim_{x \to \infty} f(x) = \left[\frac{4}{\infty} + 2\right] = 2^+$

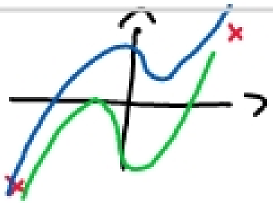
$\lim_{x \to -\infty} f(x) = \left[\frac{4}{-\infty} + 2\right] = 2^-$

$\lim_{x \to -5^+} f(x) = \left[\frac{4}{0^+} + 2\right] = \infty$

$\lim_{x \to -5^-} f(x) = \left[\frac{4}{0^-} + 2\right] = -\infty$



Hyperbel



Polynomdivision

FALSCH gerechnet

$$
\begin{array}{l}
23123 : 12 = 176 + 3/12 \\
-12 \\
\hline
9123 \\
-84 \\
\hline
723 \\
-72 \\
\hline
3
\end{array}
$$

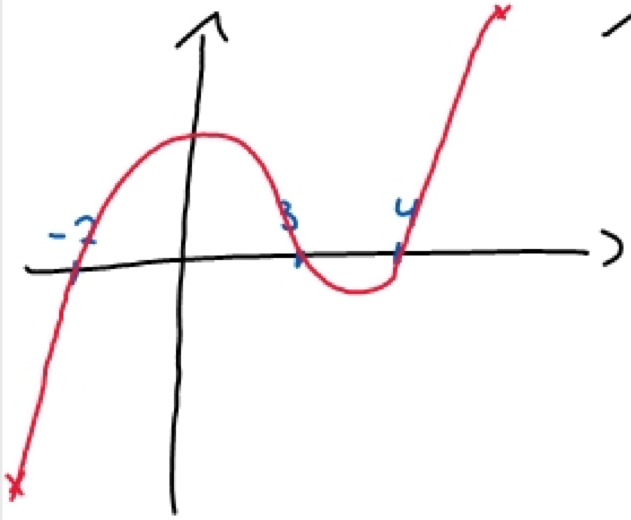
$M_{24} = \{\pm 1; \pm 2; \pm 3; \pm 4; \pm 6; \pm 8; \pm 12; \pm 24\}$

$f(x) = x^3 - 5x^2 - 2x + 24 = 0$

$x = 3 \Rightarrow (x-3)$

$$
\begin{array}{l}
(x^3 - 5x^2 - 2x + 24) : (x-3) = x^2 - 2x - 8 \\
-(x^3 - 3x^2) \\
\hline
/ \quad -2x^2 - 2x + 24 \\
-(-2x^2 + 6x) \\
\hline
/ \quad -8x + 24 \\
-(-8x + 24) \\
\hline
/ \quad / \quad //
\end{array}
$$

$(x-4)\cdot(x+2)$



$\mathbb{L} = \{-2; 3; 4\}$

$f(x) = (x-3)\cdot(x-4)\cdot(x+2) = 0$

$f(x) = x^3 - 5x^2 + 2x + 8$

$(x^3 - 5x^2 + 2x + 8) : (x+1) = \underbrace{x^2 - 6x + 8}$

$-(x^3 + x^2)$

$/ \quad -6x^2 + 2x + 8$

$-(-6x^2 - 6x)$

$/ \quad 8x + 8$

$-(8x + 8)$

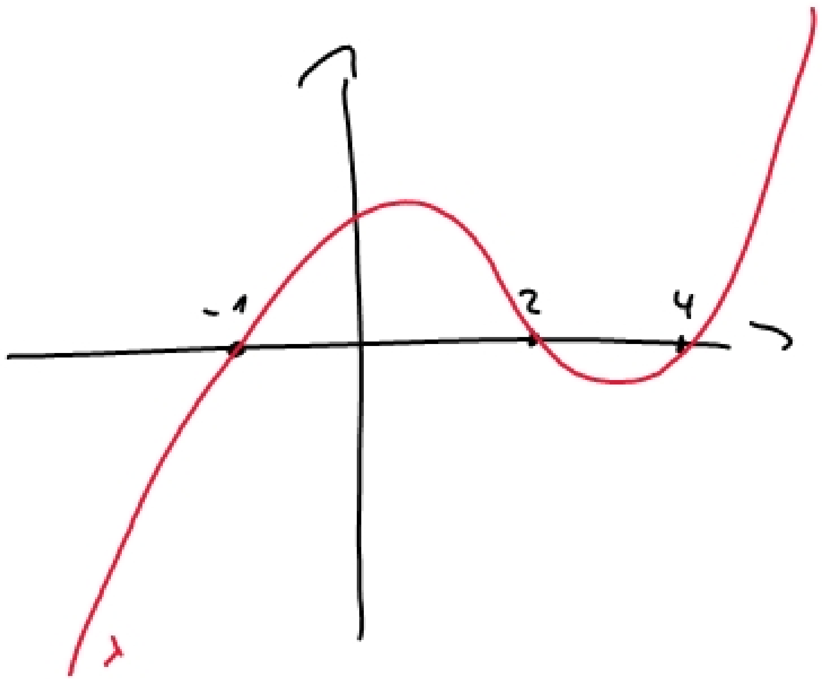
$/ \quad /$

$(x-2)\cdot(x-4)$

$x^2 + 5x + 6 = 0$

$(x+2)\cdot(x+3) = 0$

$x_1 = -2 \lor x_2 = -3$



$f(x) = (x+1)\cdot(x-2)\cdot(x-4) = 0$

$L = \{-1; 2; 4\}$

Dominanzprinzip

$x \to \infty$

$$\infty \cdot 0 \begin{cases} \nearrow \; e^x \cdot 1/x^2 \;\to\; \infty \\[2ex] \to \; 2^{x+3} \cdot \dfrac{1}{2^x} \;\to\; 8 \\[2ex] \searrow \; x^2 \cdot 1/10^x \;\to\; 0 \end{cases}$$