

S 117

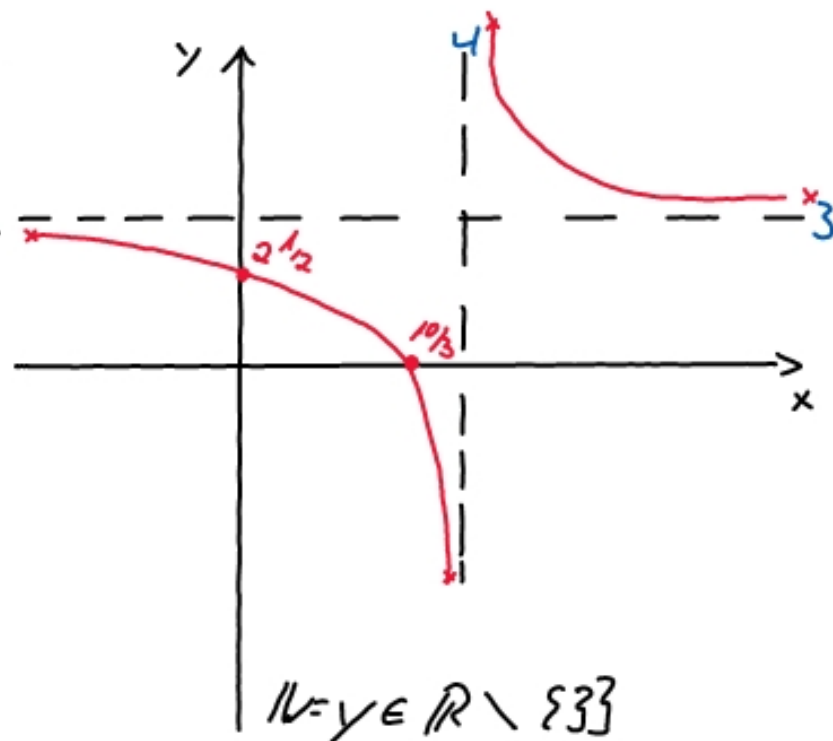
$$1) f(x) = 3 + \frac{2}{x-4} ; \quad x-4 = 0 \Rightarrow \mathbb{D} = x \in \mathbb{R} \setminus \{4\}$$

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

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

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

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



$$f(0) = 3 + \frac{2}{0-4} = \underline{2.5} \quad \rightarrow y\text{-Achse}$$

x-Achse
↑

$$f(x) = 0 = 3 + \frac{2}{x-4} \quad | -3 \quad -3 = \frac{2}{x-4} \quad | \cdot (x-4) \quad -3x + 12 = 2 \Rightarrow \underline{x = \frac{10}{3}}$$

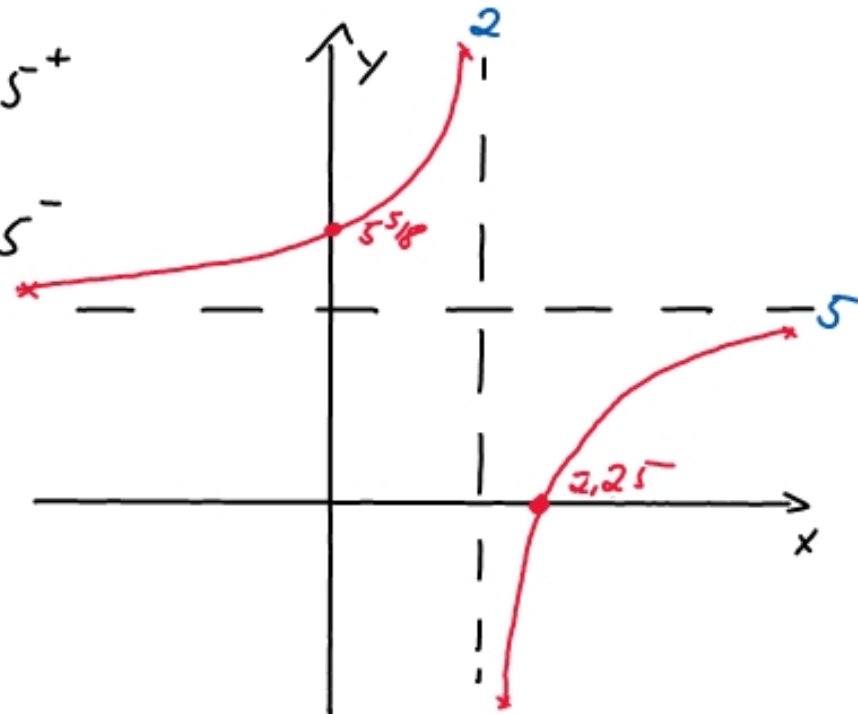
$$2) f(x) = \frac{5}{8-4x} + 5 ; 8-4x=0 \Rightarrow \mathbb{D} = x \in \mathbb{R} \setminus \{2\}$$

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

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

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

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



$$f(0) = \frac{5}{8-0} + 5 = \underline{\underline{5.625}}$$

$$\mathbb{W} = y \in \mathbb{R} \setminus \{5\}$$

$$f(x) = 0 = \frac{5}{8-4x} + 5 \quad | -5 \quad -5 = \frac{5}{8-4x} \quad | \cdot 8-4x \quad -40 + 20x = 5 \quad \dots \quad x = \frac{45}{20} \\ x = \underline{\underline{2.25}}$$

$$f(x) = x^3 - 2x^2 - 5x + 6$$

$$\mathbb{D} = \mathbb{R}$$

ganzzahlig

Polynom von Grade 3

$$f(x) = 0 \quad (x+a)(x+b)(x+c)$$

$$M_G = \{ \pm 1; \pm 2; \pm 3; \pm 6 \}$$

$$f(1) = 0 \Rightarrow (x-1)$$

$$(x^3 - 2x^2 - 5x + 6) : (x-1) = x^2 - x - 6$$

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

$$\hline -x^2 - 5x + 6$$

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

$$\hline -6x + 6$$

$$-(-6x + 6)$$

$$\hline \hline$$

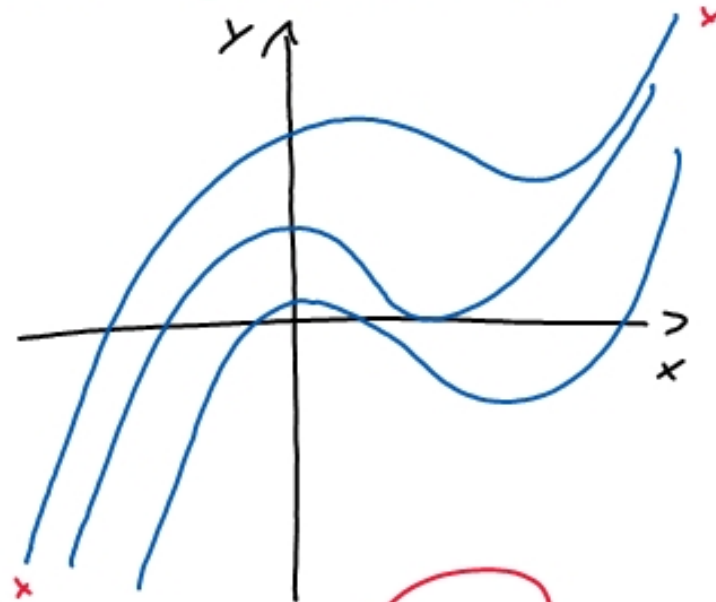
$$(x-1) \cdot (x^2 - x - 6)$$

Vieta

$$a \cdot b = -6 \wedge a + b = -1$$

$$x^2 - x - 6 = (x-3)(x+2)$$

$$f(x) = (x-1)(x-3)(x+2) = 0$$



$$23154 : 11 = 21$$

$$\hline -22$$

$$\hline 1154$$

$$\hline -11$$

$$K = \{-2; 3; 1\}$$

$$f(x) = x^3 + 3x^2 - 4x - 12$$

$$f(x) = 0$$

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

$$f(1) = -12 \neq 0$$

$$f(2) = 0 \rightarrow (x-2)$$

$$(x^3 + 3x^2 - 4x - 12) : (x-2) = x^2 + 5x + 6$$

$$\begin{array}{r} -(x^3 - 2x^2) \\ \hline \end{array}$$

$$+5x^2 - 4x - 12$$

$$\begin{array}{r} -(+5x^2 - 10x) \\ \hline \end{array}$$

$$+6x - 12$$

$$\begin{array}{r} -(6x - 12) \\ \hline \end{array}$$

$$\begin{array}{r} - \\ - \end{array}$$

$$(x+2)(x+3)$$

$$f(x) = (x-2)(x+2)(x+3)$$

$$f(x) = 0 \quad K = \{-3; -2; 2\}$$

S 124

$$\frac{1}{2} \cdot \left(\frac{4}{3} + \frac{4}{5} \right) - \frac{2}{3} \cdot \left(\frac{3}{4} - \frac{1}{6} \right)$$

$$\frac{1}{2} \cdot \left(\frac{20+12}{15} \right) - \frac{2}{3} \cdot \left(\frac{9-2}{12} \right)$$

$$\frac{1}{2} \cdot \frac{32}{15} - \frac{2}{3} \cdot \frac{7}{12} = \frac{16}{15} - \frac{7}{18}$$

$$\frac{96-35}{3 \cdot 5 \cdot 6} = \frac{61}{90}$$

$$\frac{\frac{\frac{2}{5} + \frac{4}{3}}{\frac{4}{5} - \frac{10}{13}}}{\frac{6+20}{15}} = \frac{\frac{26}{15}}{\frac{52-50}{65}} = \frac{26}{15} \cdot \frac{65}{2} = \frac{169}{3} = 58 \frac{1}{3}$$