1) $f(x) = \dfrac{2x^3 - 22x - 8x^2 + 60}{x^2 - 5x + 6}$ (HP)

2) $f(x) = \dfrac{2x^3 - 10x^2 + 6x + 18}{x^3 - 8x^2 + 21x - 18}$

} Asymptoten

SK

a) Asymptoten

b) D ; K

c) Skizze

d) Achsensch. Hpunkte

1) $f(x) = \dfrac{2 \cdot (x^3 - 4x^2 - 11x + 30)}{(x-2)(x-3)}$

$(x^3 - 4x^2 - 11x + 30) : (x-2) = x^2 - 2x - 15$

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

$-2x^2 - 11x + 30$

$-(-2x^2 + 4x)$

$-15x + 30$

$-(-15x + 30)$

$(x-5)(x+3)$

~~$f(x) = 2(x-2)(x-3)(x+5)$~~

$f(x) = \dfrac{2 \cdot (x-2)(x+3)(x-5)}{(x-2)(x-3)}$; $D = \mathbb{R} \setminus \{2;3\}$

$$f_e(x) = \frac{2\cdot(x+3)(x-5)}{x-3} = \frac{2x^2-4x-30}{x-3} \quad ; \quad D_{f_e} = \mathbb{R}\setminus\{3\}$$

$$\lim_{x\to 2^+} f(x) = \lim_{x\to 2^-} f(x) = f_e(2) = \frac{2\cdot 5\cdot(-3)}{-1} = 30$$

Behebbare Lücke (2|30)

$$\lim_{x\to 3^+} f(x) = \lim_{x\to 3^+} f_e(x) = \frac{-24}{0^+} = -\infty$$

$$\lim_{x\to 3^-} f(x) = \lim_{x\to 3^+} f_e(x) = \frac{-24}{0^-} = \infty$$

} senkr. Asym.

$$\lim_{x\to\infty} f(x) = \left[\frac{2x^2\left(1-\frac{2}{x}-\frac{15}{x^2}\right)}{x\left(1-\frac{3}{x}\right)}\right] = [2x] = \infty$$

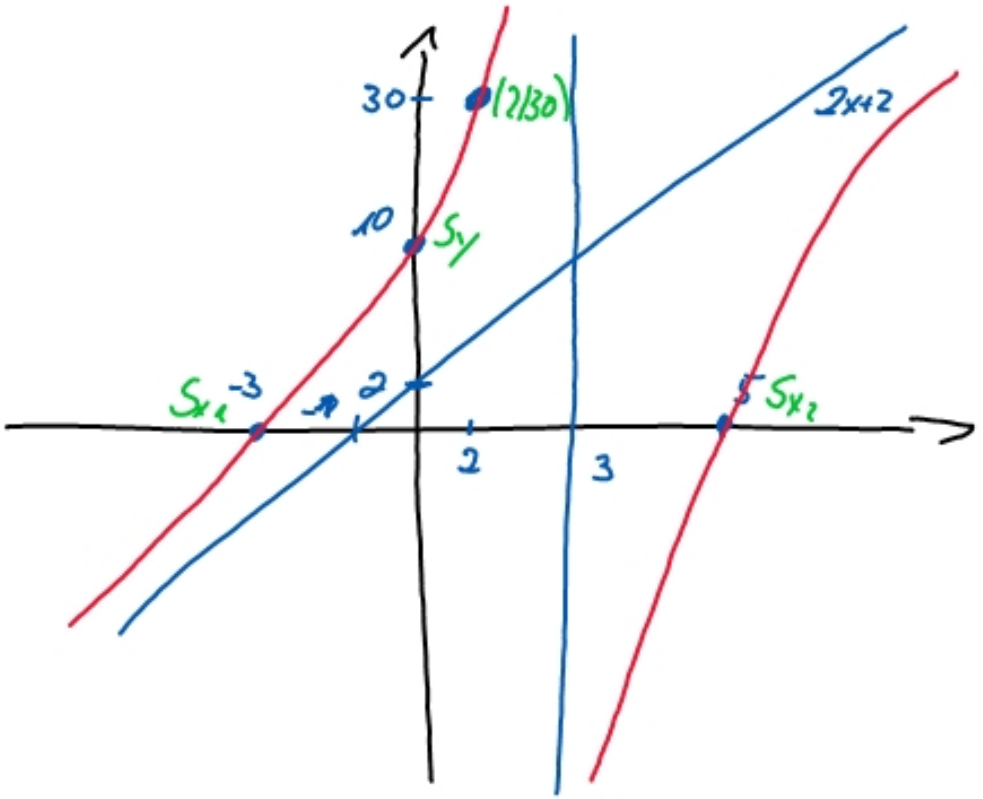
=> diagonale Asymptote

$$(2x^2 - 4x - 30) : (x-3) = 2x + 2 - \frac{24}{x-3}$$

$$\begin{array}{r} -(2x^2 - 6x) \\ \hline 2x - 30 \\ -(2x - 6) \\ \hline -24 \end{array}$$

S_x : $f(x) = 0$ $\quad S_{x_1}(-3|0)$ $\quad S_{x_2}(5|0)$

S_y : $f(0) = 10$ $\quad S_y(0|10)$


30
(2|30)
2x+2
10
S_y
S_{x1}
-3
-1
2
S_{x2}
5
1
3