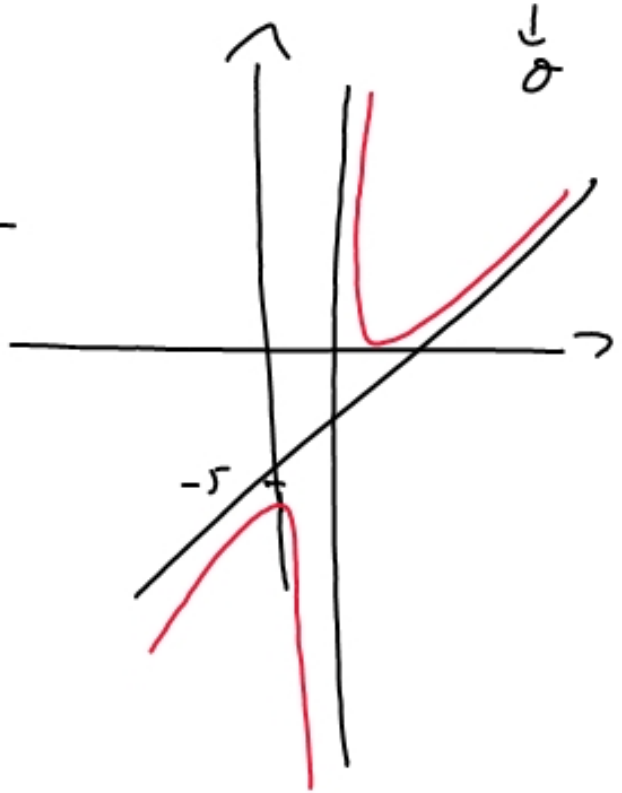
$$f(x) = \frac{x^2 - 3x + 7}{x + 2} = (x^2 - 3x + 7) : (x + 2) = x - 5 + \frac{17}{x+2}$$

$-(x^2 + 2x)$

$-5x + 7$

$-(-5x - 10)$

17



$\lim_{x \to k} f(x) = \infty$ → senkrechte Asymptote

$\lim_{x \to k} f(x) = K$ → behebbare Lücke

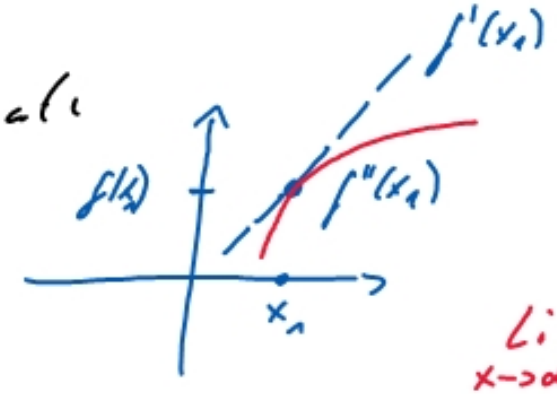
$\lim_{x \to \infty} f(x) = K$ → waagrechte Asymptote

$\lim_{x \to \infty} f(x) = \infty$ → diagonale Asymptote

$f(x)$ => y - Koordinate

$f'(x)$ => Steigung

$f''(x)$ => Krümmung



$\lim_{x \to \infty} f(x)$

$f'(x) = 0$

$f(0)$

$f(x) = 0$

$f''(x) < 0$

$f(x) = 0$

$f''(x) > 0$

$f''(x) = 0$

$f(x) = 0$

$f'(x) = 0$

$\lim_{x \to -\infty} f(x)$

b) $m_1 \cdot m_2 = -1$

1) $-x^3 + 3x^2 + 13x - 15 = f(x)$ → Nullstellen / Skizze

2) $\frac{2}{5x} - \frac{3}{4} + \frac{5}{12} - 1\frac{1}{6} = \frac{4}{15x} - 0{,}9$

3) $\dfrac{\frac{3x}{4y} - \frac{5}{3z}}{\frac{5x}{6yz} + \frac{3z}{2x}}$ $\qquad \dfrac{\frac{a}{3} + 2 + \frac{3}{a}}{\frac{1}{6} + \frac{1}{24}}$; $x^4 - 4x^3 - 8x^2 + 29x + 12 = 0$

1) $-(x^3 - 3x^2 - 13x + 15)$

$(x^3 - 3x^2 - 13x + 15) : (x - 1) = x^2 - 2x - 15$

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

$-2x^2 - 13x + 15$

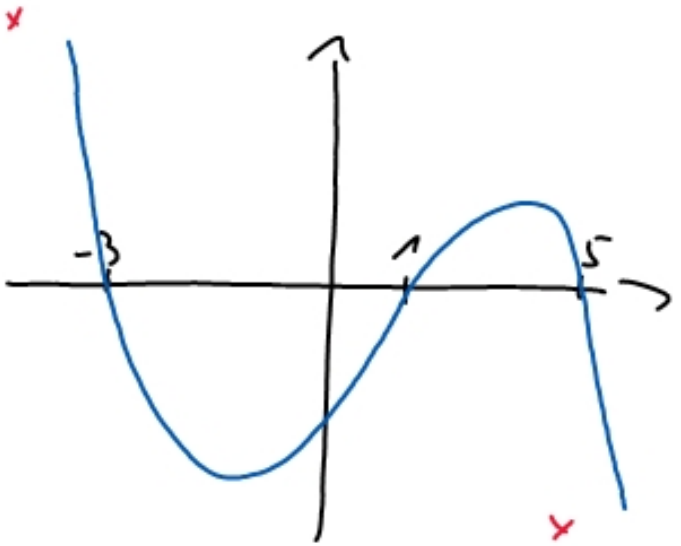
$-(-2x^2 + 2x)$

$-15x + 15$

$-(-15x + 15)$

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

$\mathbb{L} = \{-3; 1; 5\}$



$f(x) = -(x-1)(x-5)(x+3)$

2) $\frac{2}{5x} - \frac{3}{4} + \frac{5}{12} - \frac{7}{6} = \frac{4}{15x} - \frac{9}{10}$ | · HN 60x

$24 - 45x + 25x - 70x = 16 - 54x$ | -24 +54x

$-36x = -8$ | : -36

$x = \frac{8}{36} = \frac{2}{9} = 0,\overline{2}$

$\frac{x}{12} - \frac{3}{4} = \frac{1}{8}$ | · 24

$\frac{x \cdot 24^{2}}{12_{1}} - \frac{3 \cdot 24^{6}}{4_{1}} = \frac{1 \cdot 24^{3}}{8_{1}}$ → $2x - 18 = 3$ $x = 10\frac{1}{2}$

$$3)\ \frac{\frac{3x}{4y}-\frac{5}{3z}}{\frac{5x}{6yz}+\frac{3z}{2x}}=\frac{\frac{9xz-20y}{12yz}}{\frac{5x^2+9yz^2}{6xyz}}=\frac{9xz-20y}{12yz}\cdot\frac{6xyz}{5x^2+9yz^2}$$

$$=\frac{9x^2z-20xy}{10x^2+18yz^2}$$

$$3)^{*}\ \frac{\frac{a}{3}+\frac{2}{1}+\frac{3}{a}}{\frac{1}{6}+\frac{1}{2a}}=\frac{\frac{a^2+6a+3^2}{3a}}{\frac{a+3}{6a}}=(a+3)^2$$

$$\frac{(a+3)^2}{3a}\cdot\frac{6a}{a+3}=2\cdot(a+3)=2a+6$$

$$*\quad (x+2)(x+1)(x-3)(x-4)$$

$$\left(\sqrt[5]{x^2} \cdot \left(\frac{1}{x^{-3}}\right)^2 \cdot \sqrt[3]{\sqrt{x^4}} \right)^2$$

$$\left((x^2)^{1/5} \cdot (x^3)^2 \quad (x^4)^{1/3})^{1/2} \right)^2$$

$$\left(x^{2/5} \cdot x^6 \cdot x^{4/6} \right)^2 = \left(x^{2/5} \cdot x^6 \cdot x^{2/3} \right)^2$$

$$\left(x^{2/5 + 6 + 2/3} \right)^2 = \left(x^{\frac{6 + 90 + 10}{15}} \right)^2 = \left(x^{\frac{106}{15}} \right)^2$$

$$x^{212/15} = \sqrt[15]{x^{212}}$$