(A1) a) $5x - 8 \geq 12$

$\qquad 5x \geq 20$

$\qquad x \geq 4 \qquad L = [4, +\infty)$

b) $-4x + 7 < 5 - 2x$

$\qquad -2x < -2$

$\qquad x > 1 \qquad L = (1, +\infty)$

c) $0.5x^2 - 2 \leq 0.5 + 2x$

$\qquad \frac{1}{2}x^2 - 2x - \frac{5}{2} \leq 0 \mid \cdot 2$

$\qquad x^2 - 4x - 5 \leq 0 \qquad \mid \text{Vieta}$

$\qquad (x-5)(x+1) \leq 0$

$\qquad L = [-1; 5]$
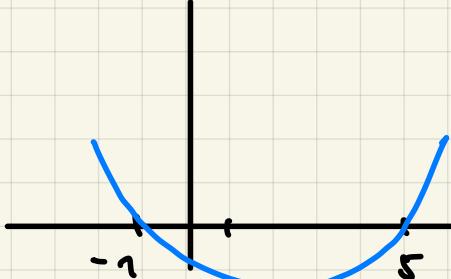
d) $4 - x^2 < 5 - 2x$

$\qquad -x^2 + 2x - 1 < 0 \mid \cdot (-1)$

$\qquad x^2 - 2x + 1 > 0$

$\qquad (x-1)^2 > 0 \qquad L = \mathbb{R} \setminus \{1\}$

e) $x^3 + \frac{1}{2}x^2 - \frac{5}{2}x + 1 \leq 0 \qquad$ Nullstelle $x_1 = 1$ erraten

$\left(x^3 + \frac{1}{2}x^2 - \frac{5}{2}x + 1\right) : (x-1) = x^2 + \frac{3}{2}x - 1$

$\underline{x^3 - x^2}$

$\qquad \qquad \qquad \qquad = (x+2)\left(x - \frac{1}{2}\right)$

$\qquad \frac{3}{2}x^2 - \frac{5}{2}x + 1 \qquad \text{Vieta}$

$\qquad \underline{\frac{3}{2}x^2 - \frac{3}{2}x}$

$\qquad \qquad -x + 1$

$L = (-\infty, -2] \cup \left[\frac{1}{2}; 1\right]$
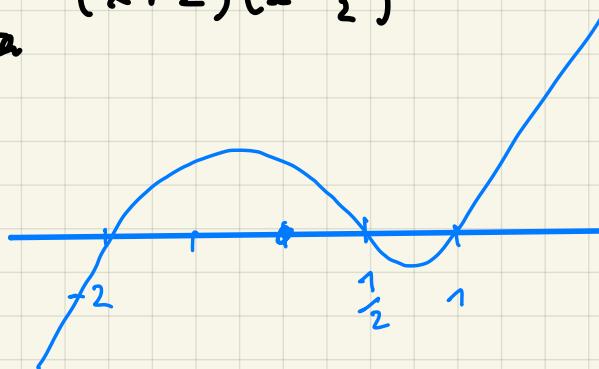
f) $x^4 + 2x^3 - 13x^2 - 14x + 24 \geq 0 \qquad$ Nullstelle $x_1 = 1$ erraten.

$\left(x^4 + 2x^3 - 13x^2 - 14x + 24\right) : (x-1) = x^3 + 3x^2 - 10x - 24 \qquad$ Nullstelle $x_2 = -2$ erraten

$\underline{x^4 - x^3}$

$\qquad 3x^3 - 13x^2$

$\qquad \underline{3x^2 - 3x^2} \qquad \qquad \left(x^3 + 3x^2 - 10x - 24\right) : (x+2) = x^2 + x - 12$

$\qquad \qquad -10x^2 - 14x \qquad \quad \underline{x^3 + 2x^2}$

$\qquad \qquad \underline{-10x^2 + 10x} \qquad \qquad x^2 - 10x \qquad \quad \text{Vieta}: x_3 = -4, \ x_4 = 3$

$\qquad \qquad \qquad -24x + 24 \qquad \quad \underline{x^2 + 2x}$

$\qquad \qquad \qquad \qquad \qquad \qquad \qquad -12x - 24$

$\qquad \qquad \qquad \qquad \qquad \qquad \qquad \underline{-12x - 24}$

$L = (-\infty; -4] \cup [-2; 1] \cup [3, +\infty)$
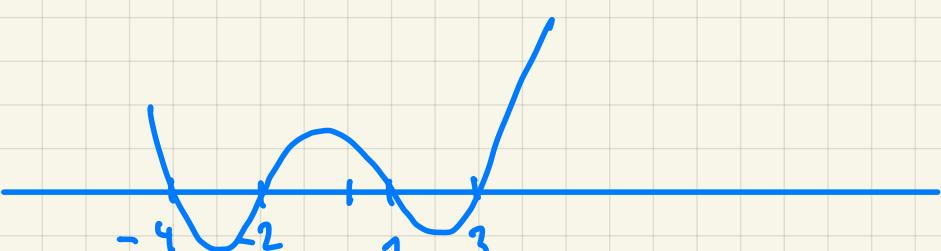
(A2) a) $\dfrac{2}{x+3} + 5 > x - 2$ $\qquad\qquad D = \mathbb{R} \setminus \{-3\}$

Hauptnenner: $x+3$ $\quad > 0$ für $x > -3$, also $x \in (-3, +\infty)$

$\qquad\qquad\qquad\qquad < 0$ für $x < -3$, also $x \in (-\infty, -3)$

b) $\dfrac{x}{x-2} - 1 < \dfrac{1}{x+1} + x$ $\qquad\qquad D = \mathbb{R} \setminus \{-1; 2\}$

Hauptnenner: $(x-2)(x+1) > 0$ für $x \in (-\infty, -1) \cup (2, +\infty)$

$\qquad\qquad\qquad\qquad\quad < 0$ für $x \in (-1, 2)$

c) $\dfrac{1}{x^2 - 9} + 2 \geq \dfrac{x}{x+3} - \dfrac{1}{2x-6}$ $\qquad\qquad D = \mathbb{R} \setminus \{\pm 3\}$

Hauptnenner: $2(x+3)(x-3) > 0$ für $x \in (-\infty, -3) \cup (+3, +\infty)$

$\qquad\qquad\qquad\qquad\qquad < 0$ für $x \in (-3, +3)$