

$$\begin{aligned}
 2 - 3x &> 5 && | -2 \\
 -3x &> 3 && | \cdot (-\frac{1}{3}) \\
 x &< -1
 \end{aligned}$$

$$\begin{aligned}
 \ln 110 \cdot x &> 4 && | : \ln(110) \\
 x &< 4 : \ln(110)
 \end{aligned}$$

$$\begin{array}{l}
 |4 - \frac{1}{2}x| \\
 \underbrace{\hspace{2cm}} \\
 x=8
 \end{array}
 \begin{array}{l}
 \xrightarrow{x > 8} \ominus \quad -(4 - \frac{1}{2}x) \\
 \xrightarrow{x < 8} \oplus \quad 4 - \frac{1}{2}x
 \end{array}$$

$$1) f(x) = |2 - \frac{2}{5}x| = \begin{cases} \frac{2}{5}x - 2 & ; x \geq 5 \\ -\frac{2}{5}x + 2 & ; x < 5 \end{cases}$$

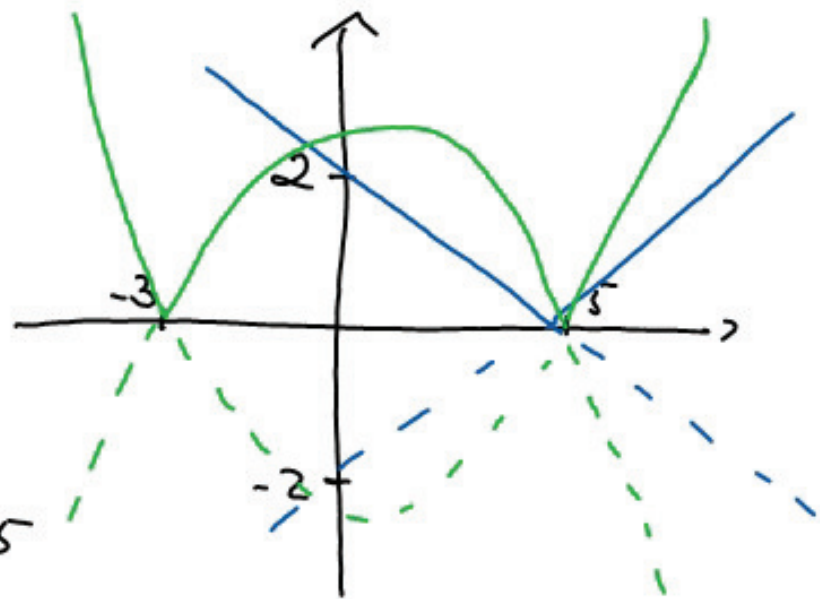
$\underbrace{\hspace{10em}}_{0} \rightarrow \underline{x=5}$

$y = m \cdot x + b$ \Rightarrow 1. b auf y -Achse
 2. $m = \frac{\alpha}{\beta} : \beta \rightarrow \alpha \updownarrow$

$$2) g(x) = |-x^2 + 2x + 15|$$

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

$$f(x) = \begin{cases} -x^2 + 2x + 15, & x \geq -3 \wedge x \leq 5 \\ x^2 - 2x - 15, & x < -3 \vee x > 5 \end{cases}$$



$$5) \left| \frac{1}{3}x + 2 \right| > 4$$

$$x = -6$$



	$x > -6$	$x < -6$
\mathbb{R}	$\frac{1}{3}x + 2 > 4$ $\frac{1}{3}x > 2$ $x > 6$	$-\frac{1}{3}x - 2 > 4$ $-\frac{1}{3}x > 6$ $x < -18$
\mathbb{E}	$x > 6$	$x < -18$
\mathbb{P}	$x = 12 \quad 6 > 4 \checkmark$	$x = -21: \quad -5 > 4 \checkmark$
\mathbb{L}	$\mathbb{L} = \{ x \in \mathbb{R} \mid x > 6 \vee x < -18 \}$	

$$\frac{3x}{6+2x} \geq 2 \quad | \cdot (6+2x) \quad ; \quad \mathbb{D} = \mathbb{R} \setminus \{-3\}$$

$$3x \geq 2 \cdot (6+2x)$$

$$3x \geq 12 + 4x$$

$$-x \geq 12$$

$$x \leq -12$$

$$x = -42$$

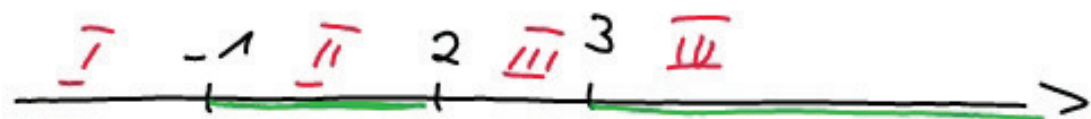
$x > -3$	+	-	$x < -3$
$3x \geq 2 \cdot (6+2x)$ $x \leq -12$			$3x \leq 2 \cdot (6+2x)$ $x \geq -12$
$x > -3 \vee x \leq -12$			$x < -3 \wedge x \geq -12$
$x=0: 0 \geq 2 \quad \checkmark$			$x=-4 \quad \frac{-12}{-2} = 6 \geq 2 \quad \checkmark$
$\mathbb{L} = x \in [-12; -3]_{\mathbb{R}}$			

$$2) \quad \frac{2x+1}{1+x} \geq 3 \quad | \cdot (1+x) \quad ; \quad \mathbb{D} = \mathbb{R} \setminus \{-1\}$$

$x > -1$	$x < -1$
$2x+1 \geq 3 \cdot (1+x)$ $2x+1 \geq 3+3x$ $-x \geq 2$ $x \leq -2$	$2x+1 \leq 3 \cdot (1+x)$ $x \geq -2$
$x > -1 \vee x \leq -2$	$x \geq -2 \wedge x < -1$
$x=0 \quad \frac{1}{1} \geq 3 \quad \downarrow$	$x=-1,5 : \frac{-2}{-0,5} = 4 \geq 3 \quad \checkmark$
$x \in [-2; -1[\mathbb{R}$	

$$5) \quad x^3 - 4x^2 + x + 6 > 0$$

$$(x+1)(x-3)(x-2) > 0$$



<u>I</u>	:	$x = -4,2$:	$\ominus \cdot \ominus \cdot \ominus$	< 0	✗
<u>II</u>	:	$x = 0$:	$\oplus \cdot \ominus \cdot \ominus$	> 0	✓
<u>III</u>	:	$x = 2,78 \approx \sqrt{16}$:	$\oplus \cdot \ominus \cdot \oplus$	< 0	✗
<u>IV</u>	:	$x = 100,4$:	$\oplus \cdot \oplus \cdot \oplus$	> 0	✓

$$\mathcal{L} = \{ x \in \mathbb{R} \mid (x > -1 \wedge x < 2) \vee x > 3 \}$$

Gauß'sches Eliminationsverfahren

$$\left| \begin{array}{ccc|c} -x & +2y & -z & = -5 \\ x & -3y & +2z & = 8 \\ 2x & -y & +5z & = 13 \end{array} \right| \quad \begin{array}{l} \text{Pivot } 1 \rightarrow + \\ \phantom{\text{Pivot}} \\ \phantom{\text{Pivot}} \\ \phantom{\text{Pivot}} \\ \phantom{\text{Pivot}} \end{array}$$

$$\left| \begin{array}{ccc|c} -x & +2y & -z & = -5 \\ 0 & -y & +z & = 3 \\ 0 & 3y & +3z & = 3 \end{array} \right| \quad \begin{array}{l} \text{Pivot } 1.3 \rightarrow + \end{array}$$

$$\left| \begin{array}{ccc|c} -x & +2y & -z & = -5 \\ 0 & -y & +z & = 3 \\ 0 & 0 & 6z & = 12 \end{array} \right| \quad \begin{array}{l} -x - 2 - 2 = -5 \quad x=1 \\ -y + 2 = 3 \quad y = -1 \\ z = 2 \end{array}$$

$$S(1|-1|2)$$

$$\left| \begin{array}{rcl} x + 3y & -2z & = -2 \\ -2x - 5y & +2z & = -1 \\ 3x + 2y & -z & = 2 \end{array} \right| \quad \text{Plot } \left. \begin{array}{l} (1 \cdot 2) \\ (1 \cdot (-3)) \end{array} \right\} +$$

$$\left| \begin{array}{rcl} x + 3y & -2z & = -2 \\ 0 & y & -2z = -5 \\ 0 & -7y & +5z = 8 \end{array} \right| \quad \text{Plot } (1 \cdot 7) +$$

$$\left| \begin{array}{rcl} x + 3y & -2z & = -2 \\ 0 & y & -2z = -5 \\ 0 & 0 & -9z = -27 \end{array} \right| \quad \begin{array}{l} x + 3 - 6 = -2 \quad x = 1 \\ y - 6 = -5 \quad y = 1 \\ \rightarrow z = 3 \quad \curvearrowright \end{array}$$

$$K = (1 \ 1 \ 1 \ 3)$$