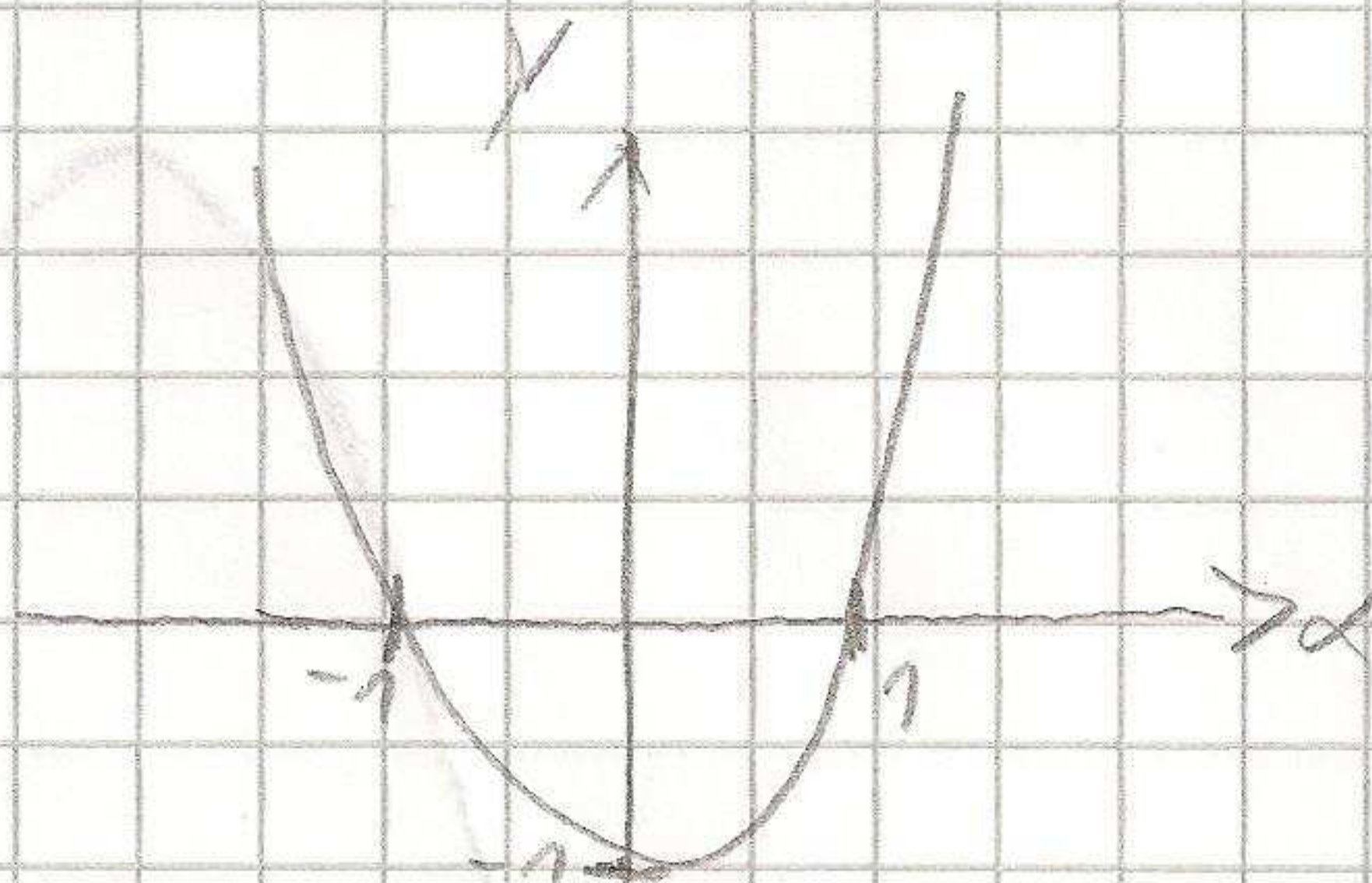


(A7) b) $[7] = \{x \mid x \in \mathbb{Z}, x \sim 7\}$
 $= \{\dots, -14, -7, 0, 7, 14, \dots\}$

(A10) $g: \mathbb{R} \rightarrow \{y \geq -1\}, x \mapsto x^2 - 1$

Richt: Fehler in
Angabe



$g_1 = g|_{\{x \geq 0\}}$

$y = x^2 - 1$
 $y + 1 = x^2$
 $x = \pm \sqrt{y + 1}$

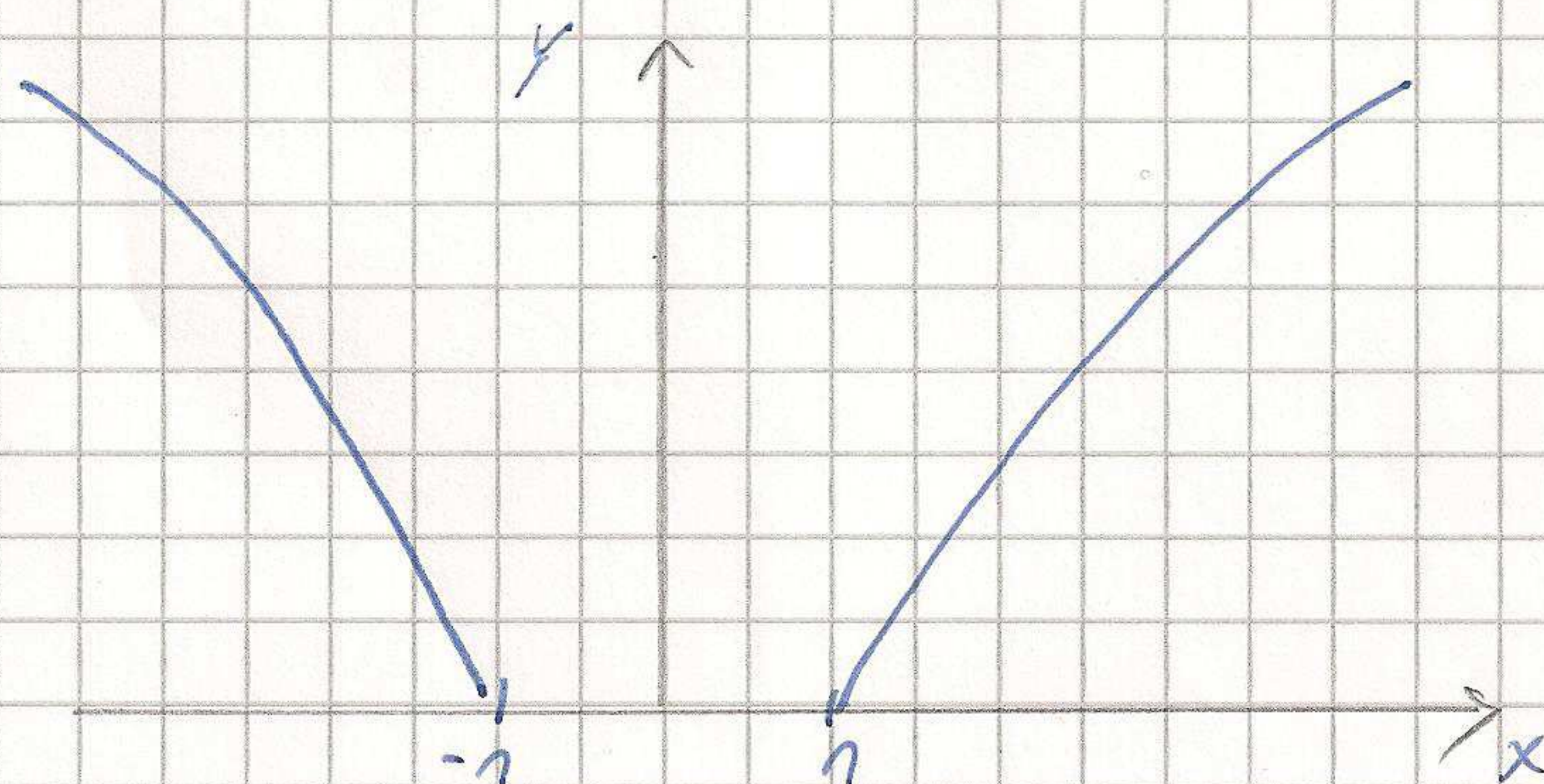
$\Rightarrow g_1^{-1}(x) = \sqrt{x + 1}$

$g_2 = g|_{\{x \leq 0\}}$

$y = x^2 - 1$
 $y + 1 = x^2$
 $x = \pm \sqrt{y + 1}$

$\Rightarrow g_2^{-1}(x) = -\sqrt{x + 1}$

h): $\{|x| \geq 1\} \rightarrow \mathbb{R}_0^+, x \mapsto \sqrt{x^2 - 1}$



$h_1 = h|_{\{x \geq 1\}}$

$y = x^2 - 1$
 $y^2 + 1 = x^2$

$x = \pm \sqrt{y^2 + 1}$

$h_1^{-1}(x) = +\sqrt{x^2 + 1}$

$h_2 = h|_{\{x \leq -1\}}$

$y = x^2 - 1$
 $y^2 + 1 = x^2$

$x = \pm \sqrt{y^2 + 1}$

$h_2^{-1}(x) = -\sqrt{x^2 + 1}$

d) $K: \mathbb{R} \rightarrow \{y \leq -1\}, x \mapsto -(x+1)^2 - 1$

$K_1 = K|_{\{x \geq -1\}} \quad K_2 = K|_{\{x < -1\}}$

$$y = -(x+1)^2 - 1$$

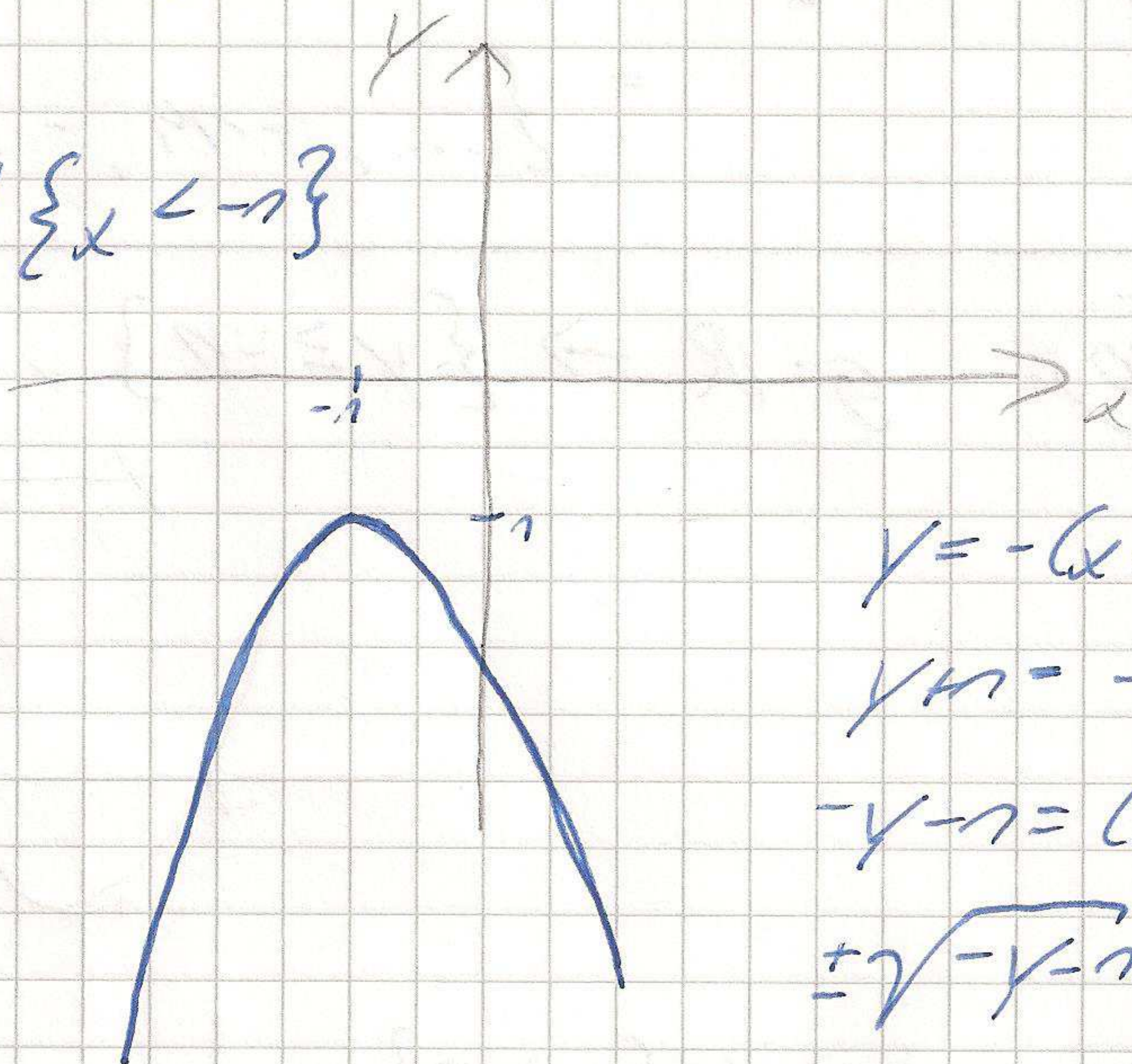
$$y+1 = -(x+1)^2$$

$$-y-1 = (x+1)^2$$

$$\pm \sqrt{-y-1} = x+1$$

$$x = -1 \pm \sqrt{-y-1}$$

$$K_1^{(1)}(x) = -1 \pm \sqrt{-x-1}$$



$$y = -(x+1)^2 - 1$$

$$y+1 = -(x+1)^2$$

$$-y-1 = (x+1)^2$$

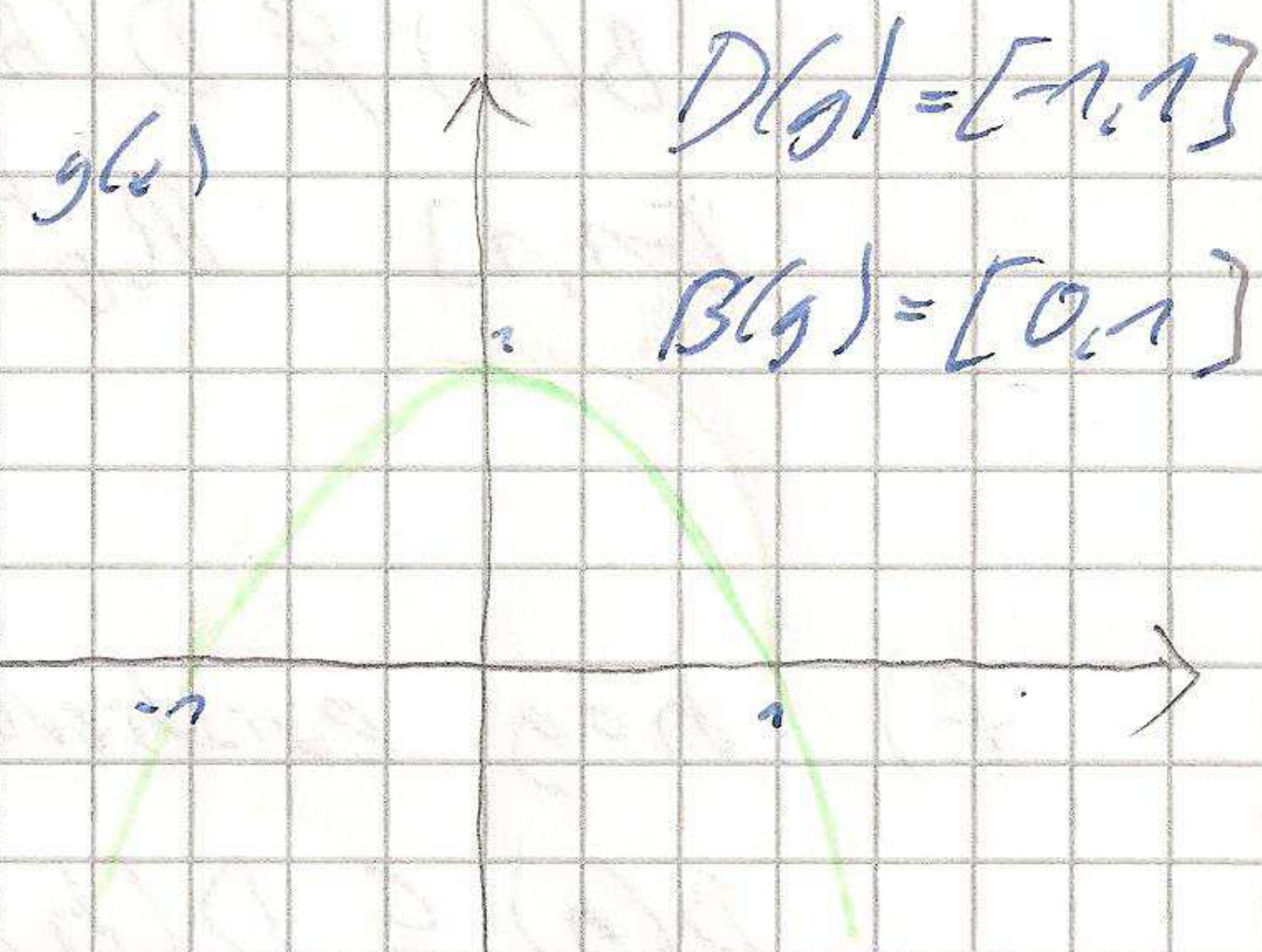
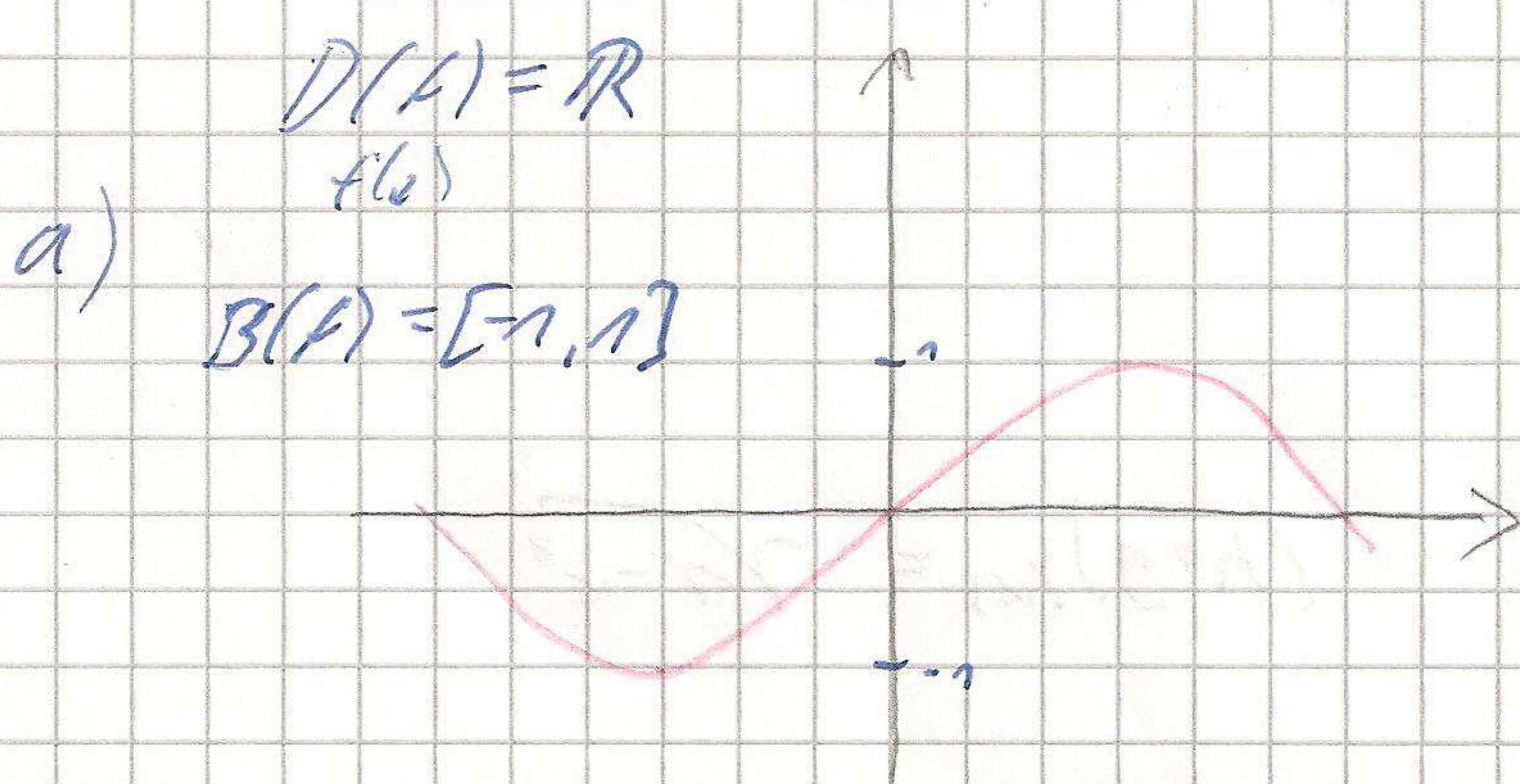
$$\pm \sqrt{-y-1} = x+1$$

$$x = -1 \pm \sqrt{-y-1}$$

$$K_2^{(1)}(x) = -1 \pm \sqrt{-x-1}$$

AM

$$f \circ g = f(g(x))$$



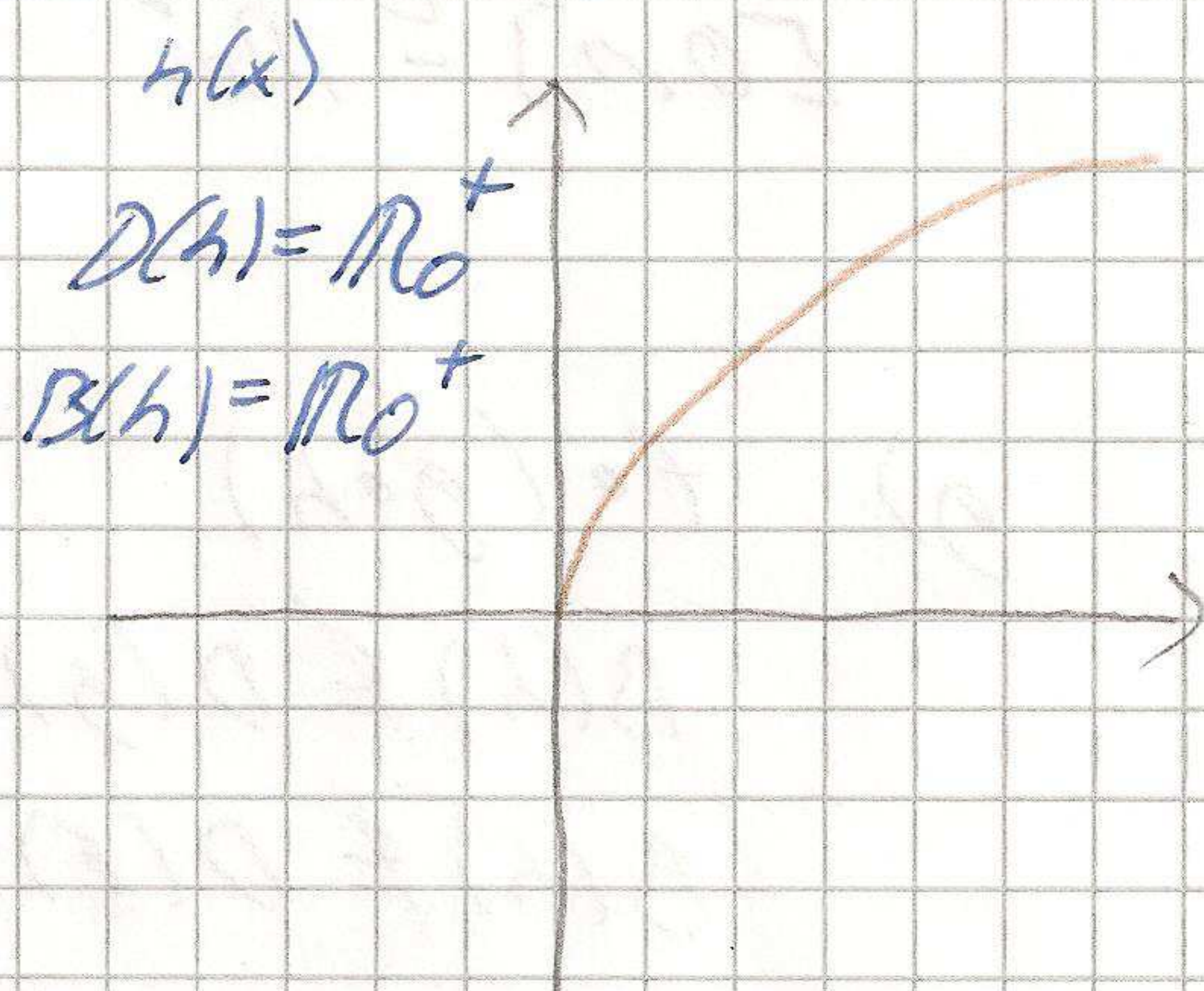
Kriterium / Bedingung:

$$B(g) \subseteq D(f)$$

$$[0, 1] \subseteq \mathbb{R} \quad \checkmark$$

$$f \circ g = f(g(x)) = \sin(1 - x^2)$$

$$B(f \circ g) = [0, \sin(1)]$$



b)

$$f \circ h = f(h(x))$$

$$f \circ h = f(h(x)) = \sin(\sqrt{x})$$

$$B(h) \subseteq D(f)$$

$$\mathbb{R}_0^+ \subseteq \mathbb{R} \quad \checkmark$$

$$B(f \circ h) = [-1, 1]$$

c)

$$g \circ h = g(h(x))$$

$$g \circ h = 1 - (\sqrt{x})^2$$

$$B(h) \subseteq D(g)$$

$$\mathbb{R}_0^+ \subseteq [-1, 1] \quad \times$$

d)

$$g \circ f = g(f(x))$$

$$g \circ f = 1 - [\sin(x)]^2$$

$$B(f) \subseteq D(g)$$

$$[-1, 1] \subseteq [-1, 1] \quad \checkmark$$

$$B(g \circ f) = [0, 99 \leq x \leq 1]$$

e) $h \circ f$ existiert nicht

$$B(f) \not\subseteq D(h)$$

$$[-1, 1] \not\subseteq \mathbb{R}_0^+$$

f) $h \circ g$ existiert

$$(h \circ g)(x) = \sqrt{1-x^2}$$

$$B(g) \subseteq D(h)$$

$$[0, 1] \subseteq \mathbb{R}_0^+$$

g) $f \circ (g \circ h)$

existiert nicht, weil $g \circ h$ nicht existiert

$$B(h) \not\subseteq D(g)$$

$$B(h) \not\subseteq D(f)$$

h) $f \circ (h \circ g)$ existiert, da

$$B(h \circ g) \subseteq B(h) \subseteq D(f)$$

i) $g \circ (h \circ f)$ existiert nicht, da

$h \circ f$ nicht existiert