Vorlesung

allgemeine mathematisch präzise Aussage (inkl. Notation)

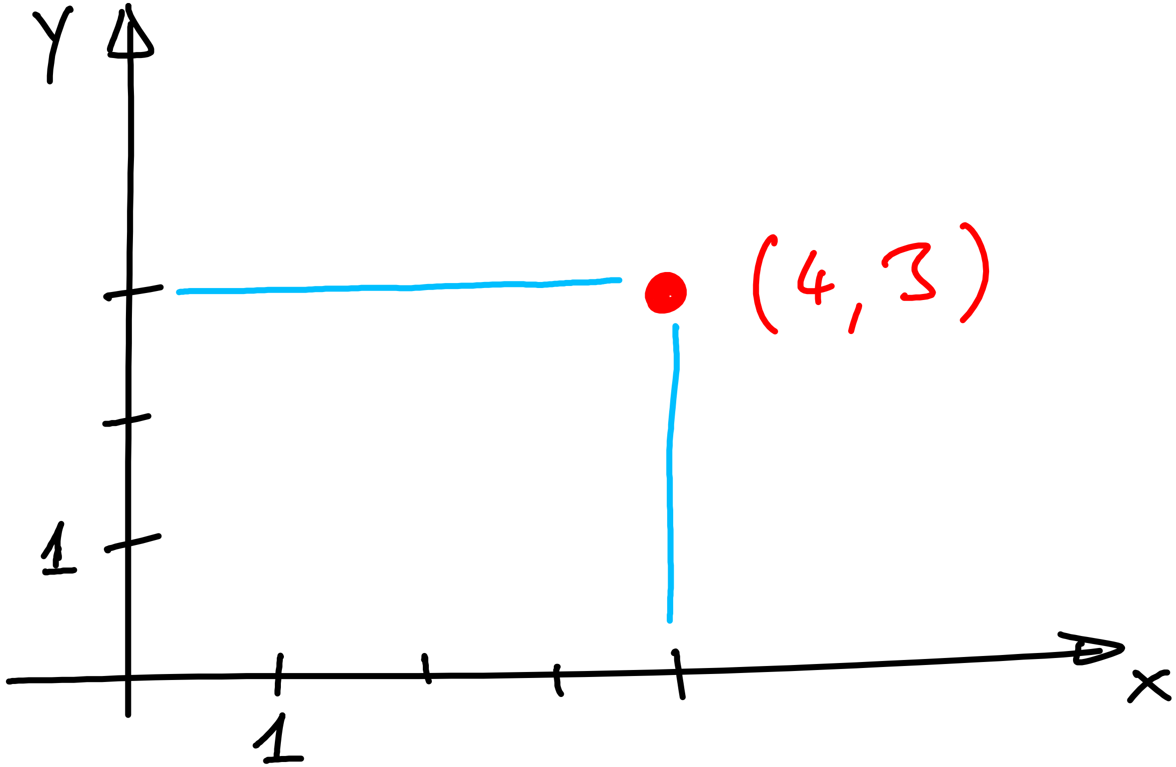
ÜA

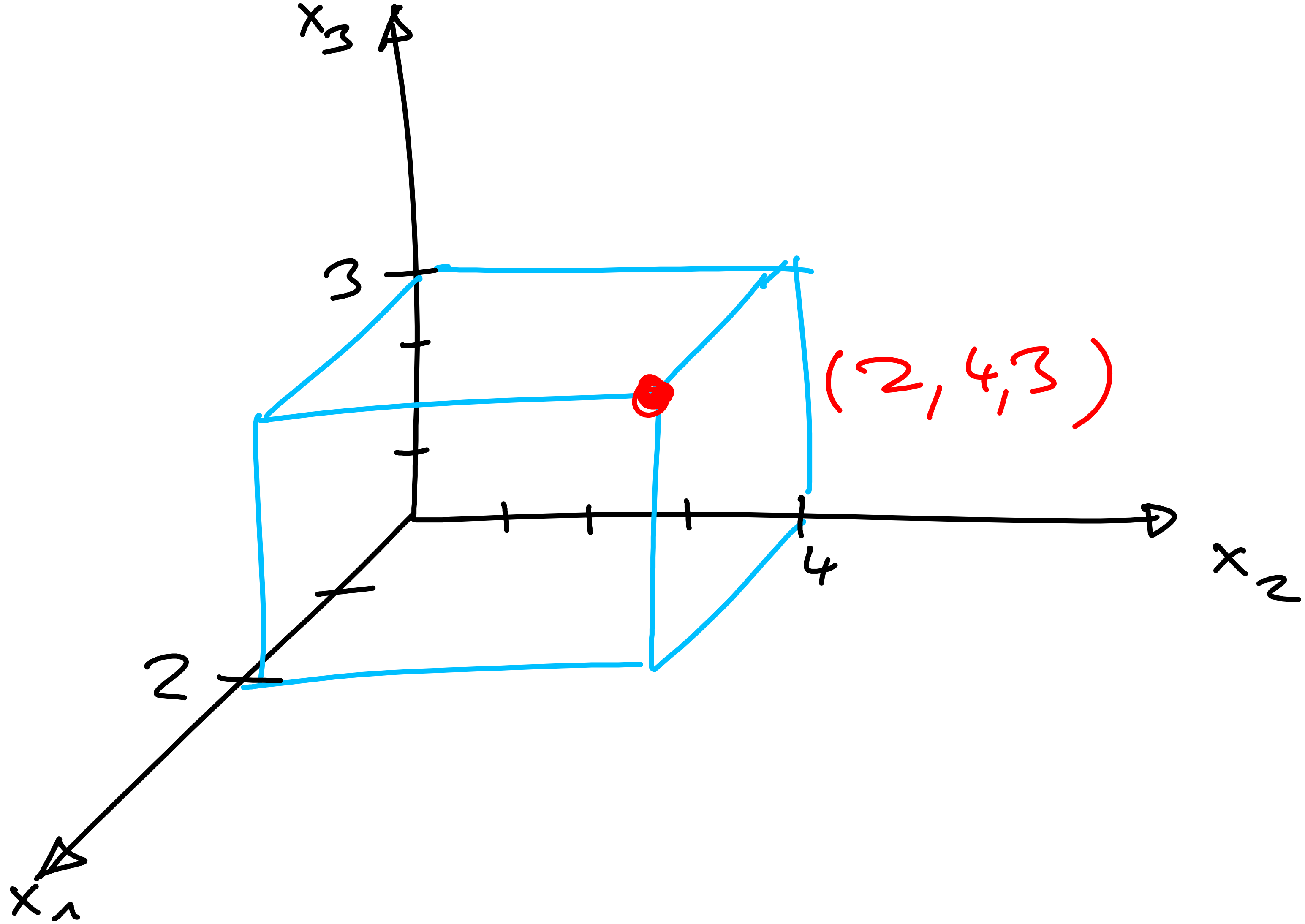
in Alltagssprache formuliert

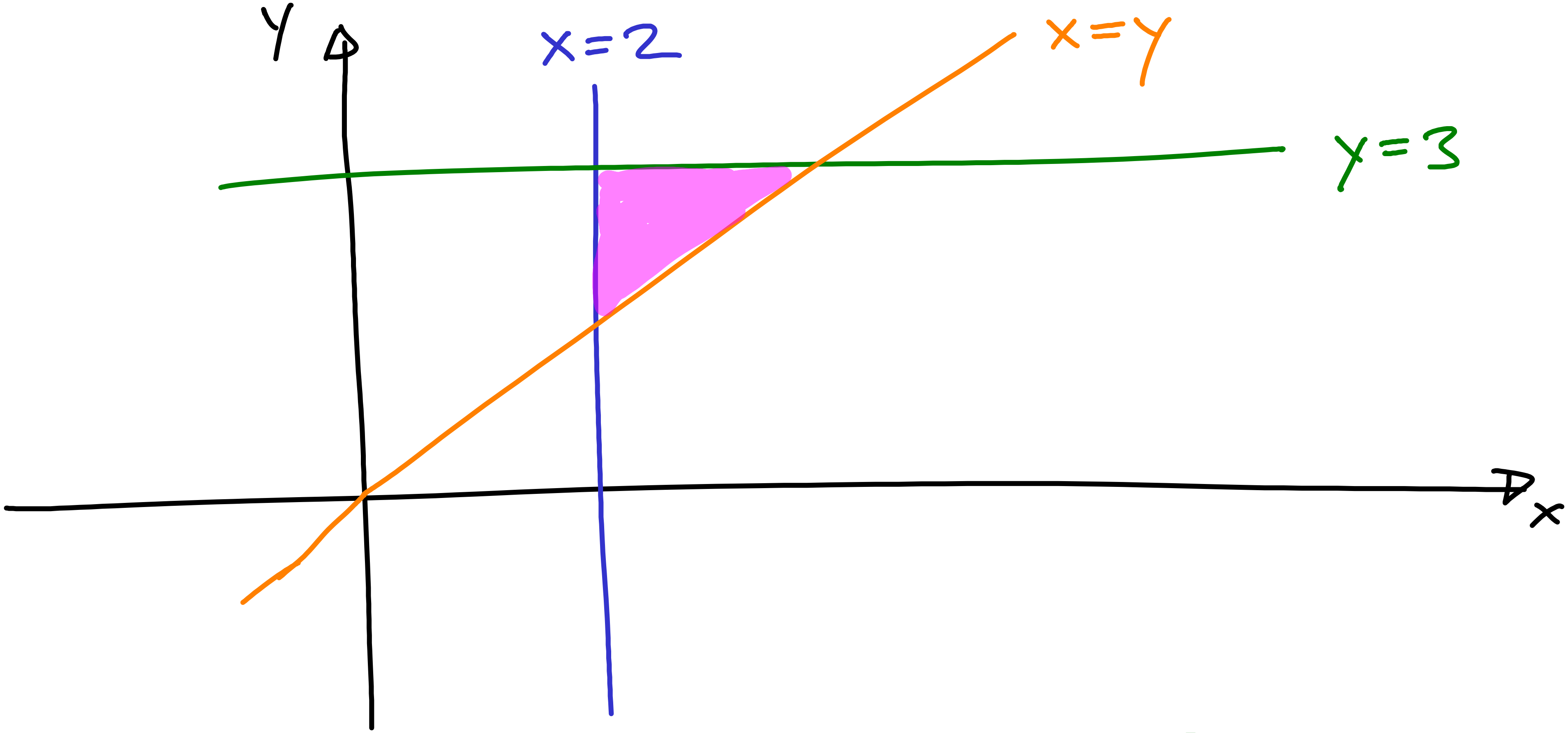
mathematisch formulieren

ÜBERSETZEN

(+ Lösen)


Y
1
1
X
(4, 3)


x_3
x_2
x_1
3
2
4
(2, 4, 3)

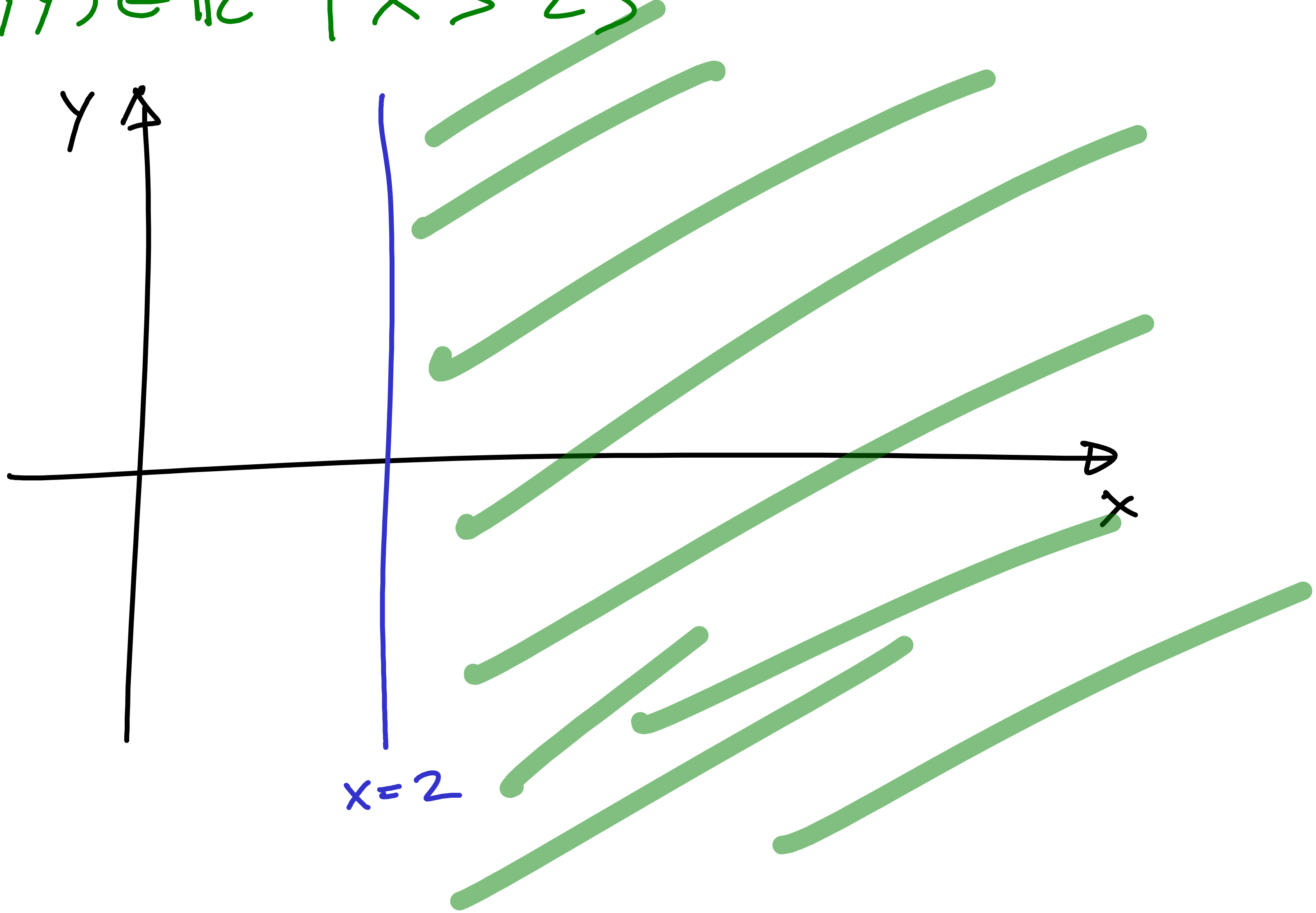


$\{(x,y)\in\mathbb{R}^2 \mid x=2\}$, $\{(x,y)\in\mathbb{R}^2 \mid y=3\}$

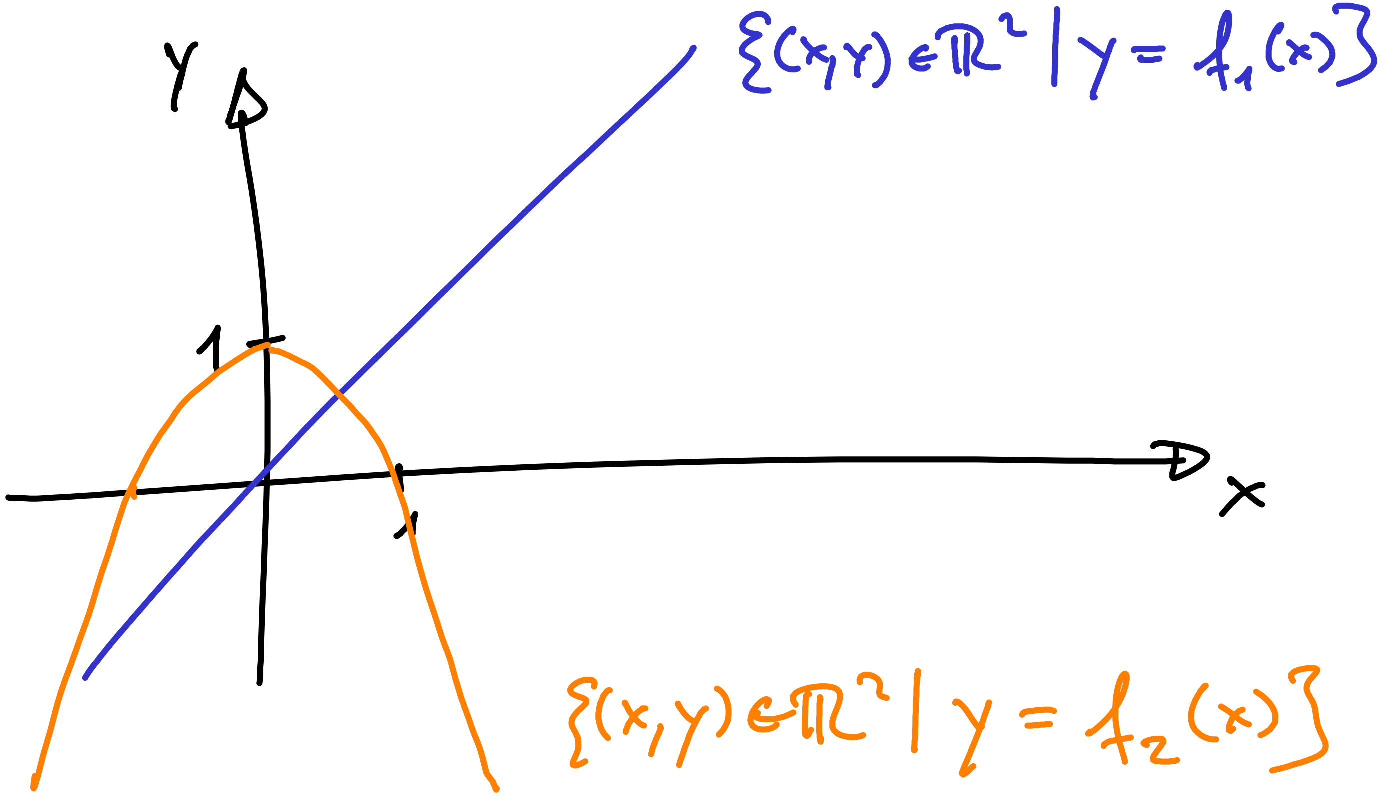
$\{(x,y)\in\mathbb{R}^2 \mid x=y\}$

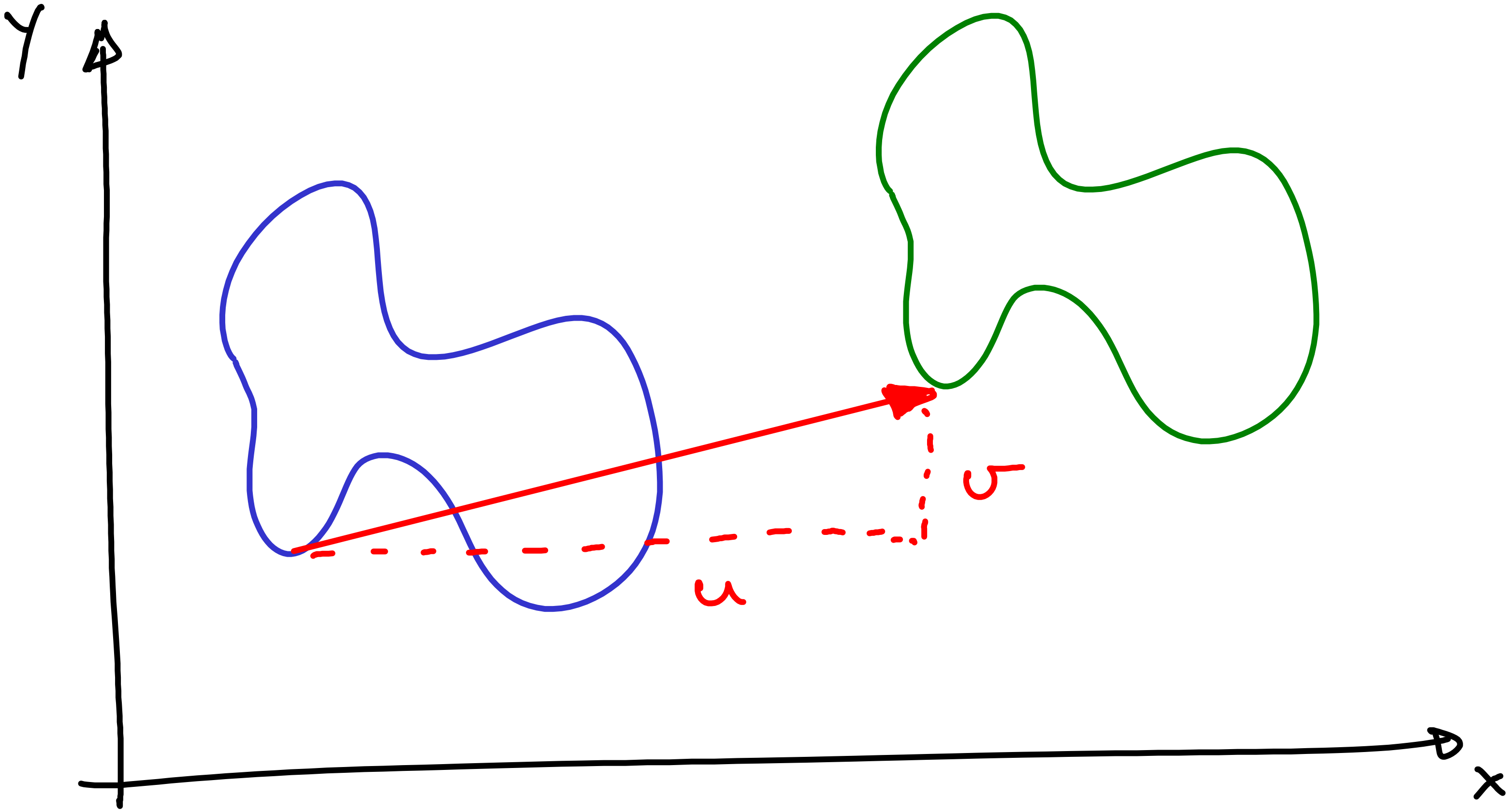
$\{(x,y)\in\mathbb{R}^2 \mid x\underline{>}2\}\cap\{(x,y)\in\mathbb{R}^2 \mid y<3\}\cap\{(x,y)\in\mathbb{R}^2 \mid y>x\}$

$\{(x,y) \in \mathbb{R}^2 \mid x > 2\}$



$f_1(x) = x \quad , \quad f_2(x) = 1 - x^2$





Translation : $(x,y) \longmapsto (x+u,\, y+v)$

$$G_f := \{(x,y) \in \mathbb{R}^2 \mid y = f(x)\}$$

Translation : $(x,y) \longmapsto (x+u, y+v) = (\tilde{x}, \tilde{y})$

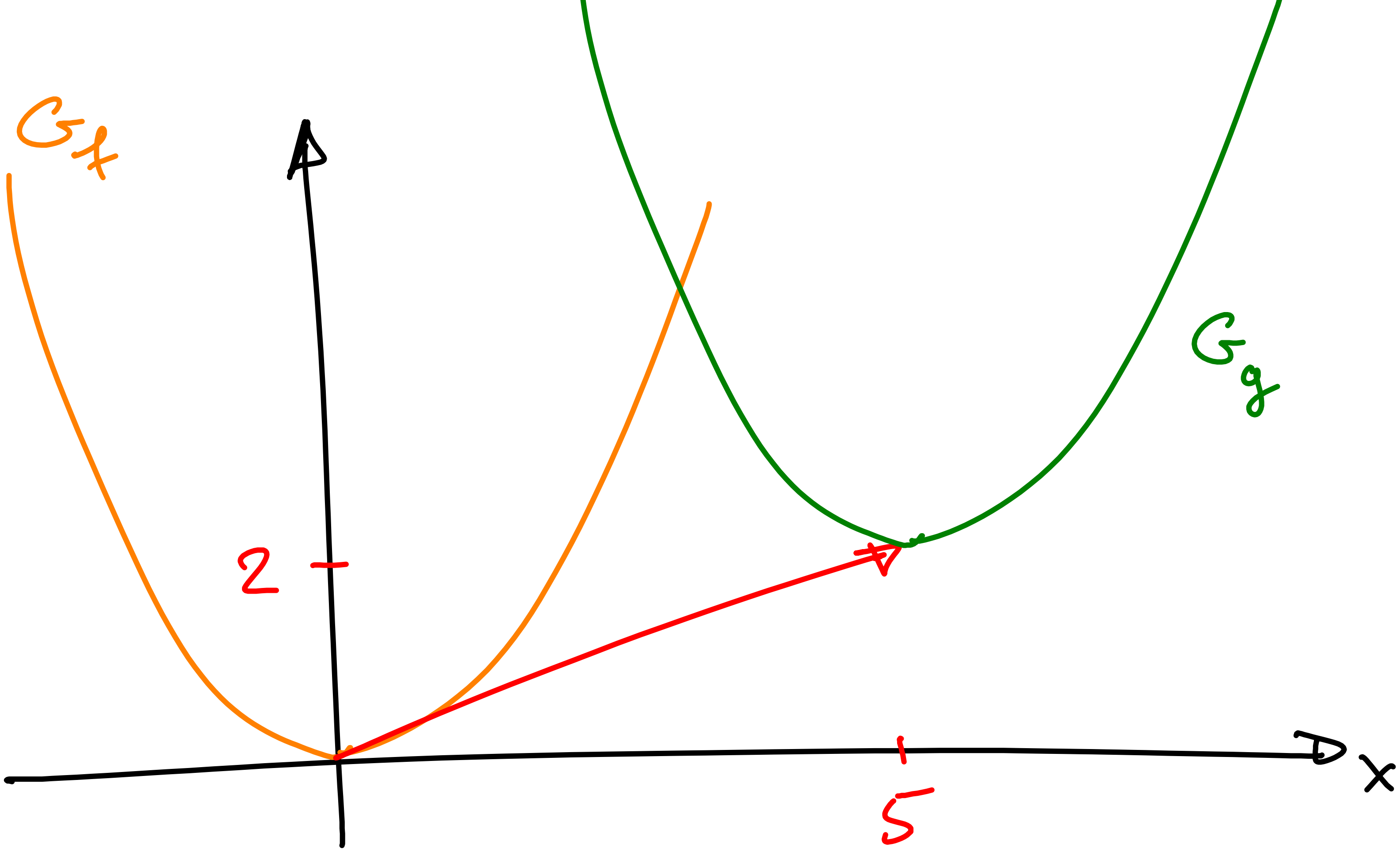
$$G_f \longmapsto \{(\tilde{x}, \tilde{y}) \in \mathbb{R}^2 \mid y = f(x)\}$$

$$= \{(\tilde{x}, \tilde{y}) \in \mathbb{R}^2 \mid \tilde{y} - v = f(\tilde{x} - u)\}$$

$$= \{(\tilde{x}, \tilde{y}) \in \mathbb{R}^2 \mid \tilde{y} = f(\tilde{x} - u) + v\}$$

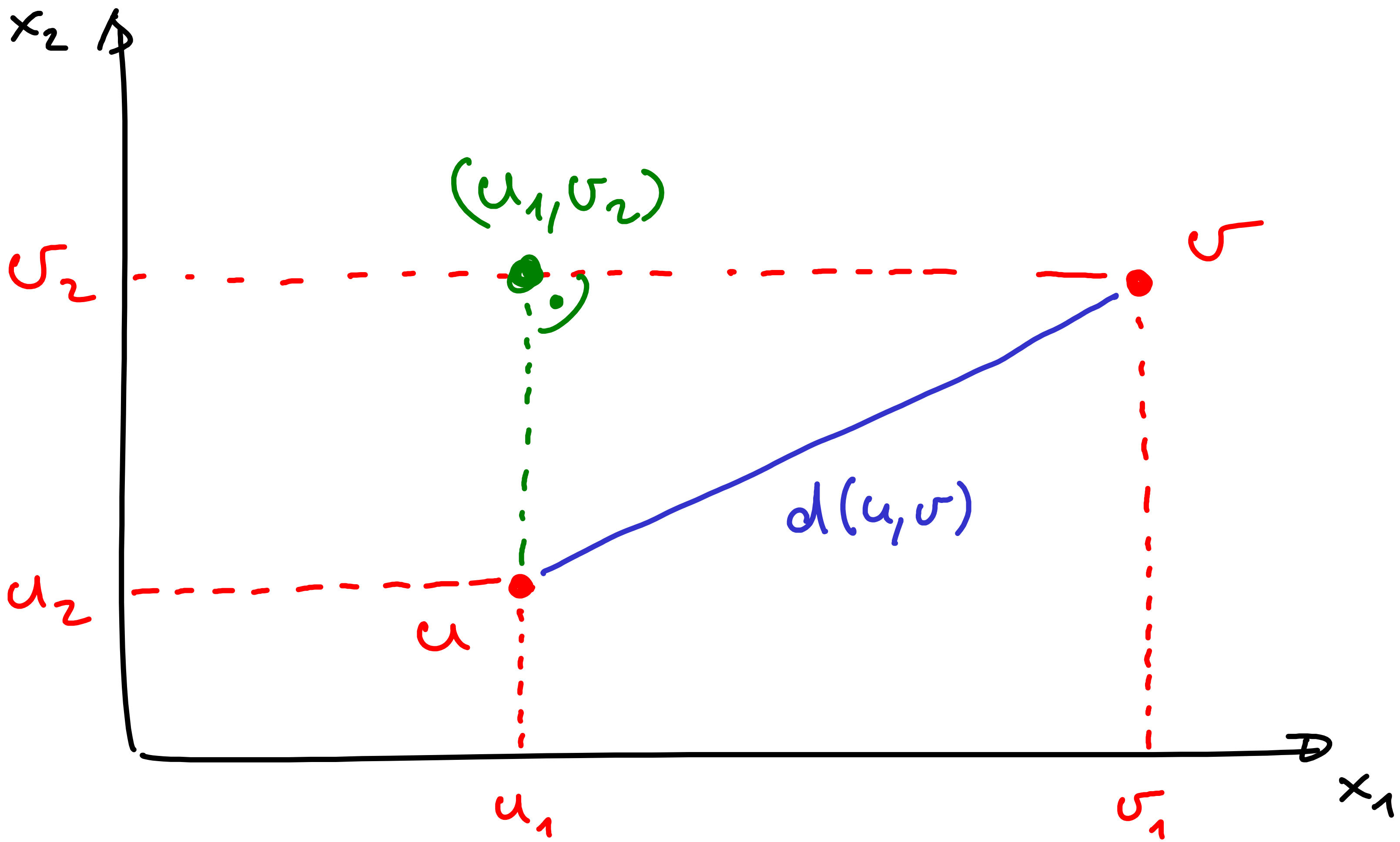
$$= \{(x, y) \in \mathbb{R}^2 \mid y = f(x-u) + v\} = G_g$$

wobei $\quad g(x) = f(x-u) + v$



$f(x) = x^2$

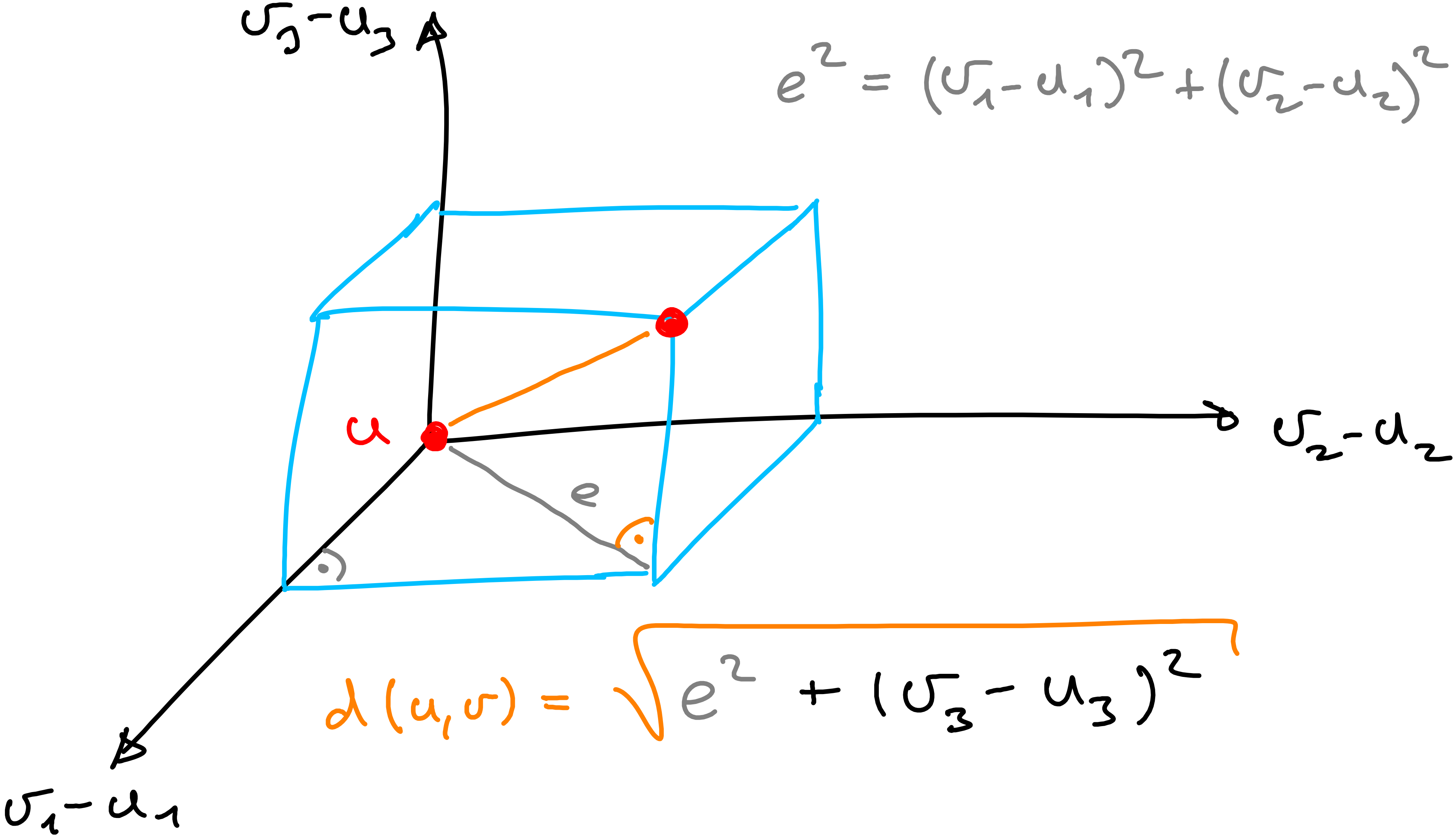
$g(x) = f(x-5) + 2$



$$[d(u,v)]^2 = (v_1 - u_1)^2 + (v_2 - u_2)^2$$

$$\Rightarrow \quad d(u,v) = \sqrt{(v_1-u_1)^2 + (v_2-u_2)^2}$$

$$e^2 = (v_1 - u_1)^2 + (v_2 - u_2)^2$$



$$d(u,v) = \sqrt{e^2 + (v_3 - u_3)^2}$$

Erklärung zur Bergmannschen Regel

Wärmeverlust proportional zur Oberfläche O
(im Wesentlichen)

Wärmeproduktion proportional zum Volumen V
(im Wesentlichen)

Quotient

$$\frac{O}{V} \xmapsto[(x,y,z) \mapsto (\alpha x, \alpha y, \alpha z)]{\text{zentr. Streckung}} \underbrace{\frac{1}{\alpha}}_{<1} \, \frac{O}{V}$$

$$\alpha > 1$$