

Ein allgemeines LGS(2)

$$\text{I } ax + by = c \quad | -by$$

$$\text{II } dx + ey = f \quad | -ey$$

$$\text{I } ax = -by + c \quad | :a$$

$$\text{II } dx = -ey + f \quad | :d$$

$$\text{I } x = \frac{-by + c}{a}$$

$$\text{II } x = \frac{-ey + f}{d}$$

$$\text{II} = \text{I}$$

$$\frac{-by + c}{a} = \frac{-ey + f}{d} \quad | \cdot a$$

$$\Rightarrow -by + c = \frac{(-ey + f) \cdot a}{d} \quad | \cdot d$$

$$\Rightarrow (-by + c) \cdot d = (-ey + f) \cdot a$$

$$\Rightarrow -dby + cd = -eay + fa \quad | +eay$$

$$\Rightarrow eay - dby + cd = fa \quad | -cd$$

$$\Rightarrow eay - dby = fa - cd \quad | \text{Ausklammern von } y$$

$$\Rightarrow y \cdot (ea - db) = fa - cd \quad | : (ea - db)$$

$$\Rightarrow y = \frac{fa - cd}{ea - db}$$

$$\boxed{\text{ALSO } y = \frac{f \cdot a - c \cdot d}{a \cdot e - d \cdot b}}$$

gesucht x, y
 $a, b, c, d, e, f \in \mathbb{R}$ beliebig
 aber konstant

genauso Auflösen nach x

$$\text{I} \quad ax + by = c \quad | -ax$$

$$\text{II} \quad dx + ey = f \quad | -dx$$

$$\text{I} \quad by = c - ax \quad | : b$$

$$\text{II} \quad ey = f - dx \quad | : e$$

$$\text{I} \quad y = \frac{c - ax}{b}$$

$$\text{II} \quad y = \frac{f - dx}{e}$$

$\text{II} = \text{I}$

$$\frac{c - ax}{b} = \frac{f - dx}{e} \quad | \cdot b$$

$$\Rightarrow c - ax = \frac{(f - dx) \cdot b}{e} \quad | \cdot e$$

$$\Rightarrow (c - ax) \cdot e = (f - dx) \cdot b$$

$$\Rightarrow ce - aex = fb - dbx \quad | + aex$$

$$\Rightarrow ce = fb + aex - dbx \quad | - fb$$

$$\Rightarrow ce - fb = aex - dbx \quad | \text{Ausklammern von } x$$

$$\Rightarrow ce - fb = (ae - db)x \quad | : (ae - db)$$

$$\Rightarrow \frac{ce - fb}{ae - db} = x$$

ALSO $x = \frac{ce - fb}{a \cdot e - d \cdot b}$