AUFGABEN

0.

$\frac{x(3+2x)}{6-2x} > 1-x$

I. Lösen Sie das folgende lineare Gleichungssystem grafisch.

a) $\left| \begin{array}{l} 2x - y = -7 \\ 3x + 4y = 6 \end{array} \right|$

b) $\left| \begin{array}{l} y - 2x = 4 \\ x + 3y = -9 \end{array} \right|$

II. Sie die folgenden Gleichungssysteme. Wenden Sie insgesamt 3 verschiedene Verfahren an.

a) $\left| \begin{array}{l} x + 3y = 25 \\ 4x - y = 22 \end{array} \right|$

b) $\left| \begin{array}{c} -5 = 0{,}25y + 0{,}5x \\ 2y + 4x = 100 \end{array} \right|$

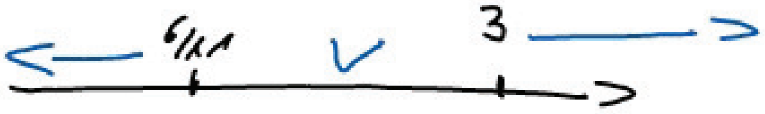
c) $\left| \begin{array}{c} \frac{1}{2}x - \frac{1}{5}y = \frac{1}{12} \\ 2y - \frac{3}{8}x = \frac{9}{4} \end{array} \right|$

d) $\left| \begin{array}{l} 3y - 2x = 13 \\ 8x + 4y = -4 \end{array} \right|$

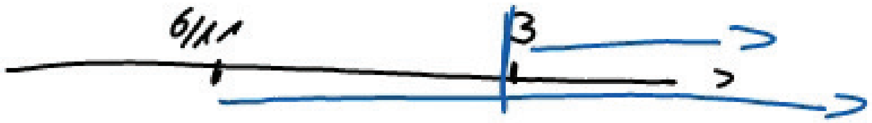
e) $\left| \begin{array}{c} 2y = 1 - 0{,}5x \\ 0{,}25x = 0{,}6 - y \end{array} \right|$

f) $\left| \begin{array}{c} \frac{1}{3}y + \frac{1}{6}x = \frac{1}{15} \\ \frac{3}{2}x = \frac{3}{5} - 3y \end{array} \right|$

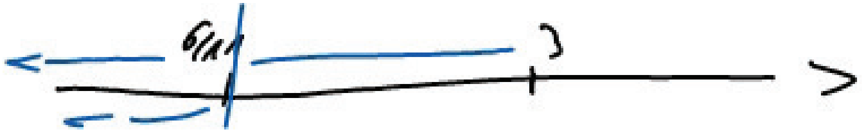
a. $x > 3 \lor x < 6/11$



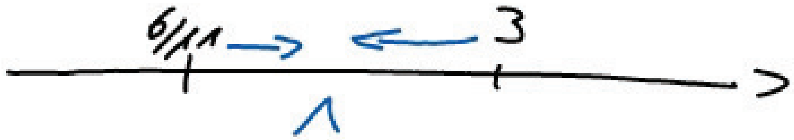
$\boxed{x > 3}$ $\cancel{x > 6/11}$



$\cancel{x <} 3$ $\boxed{y < 6/11}$



$x < 3 \land x > 6/11$



$$\mathbb{L} = \{ x \in \mathbb{R} \mid x < 3 \land x > 6/11 \}$$

I. b) $S(-3 \mid -2)$

$y = m \cdot x + b \rightarrow b = y\text{-Achse } (0|b)$

$\Updownarrow$

$(0|b) \Rightarrow m = \frac{a}{b} \longrightarrow$

I d) $S(-2 \mid 3)$

e) $0 = \text{Zahl}$ $\Rightarrow$ $\mathbb{L} = \{\}$ parallel

f) $\left| \begin{array}{l} \frac{1}{3}y + \frac{1}{6}x = \frac{1}{15} \\ \frac{3}{2}x = \frac{3}{5} - 3y \end{array} \right| \begin{array}{l} \cdot 30 \\ \cdot 10 \end{array}$

$10y + 5x = 2 \quad | \cdot 3$ $\qquad 30y + \boxed{15x} = 6$

$\boxed{15x} = 6 - 30y$

$\left| \begin{array}{l} 5x + 10y = 2 \\ 15x + 30y = 6 \end{array} \right| \begin{array}{l} \cdot (-3) \\ + \end{array}$

$30y + 6 - 30y = 6$

$6 = 6$

$0 = 0$

$\mathbb{L} = \mathbb{R}$ Identität

$$\left|\begin{array}{rrrcr} -x & +2y & -3z & = & -6 \\ x & -3y & +z & = & -2 \\ 2x & +y & +4z & = & 16 \end{array}\right|$$

Pivot $\Big)+$ $\quad$ $1\cdot 2\Big)+$

$$\left|\begin{array}{rrrcr} -x & +2y & -3z & = & -6 \\ 0 & -y & -2z & = & -8 \\ 0 & 5y & -2z & = & 4 \end{array}\right|$$

$1\cdot 5\Big)+$

$y = 8 - 2z$

$$\left|\begin{array}{rrrcr} -x & +2y & -3z & = & -6 \\ 0 & -y & -2z & = & -8 \\ 0 & 0 & -12z & = & -36 \end{array}\right|$$

$x = 1$

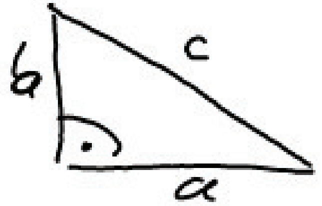
$y = 2$

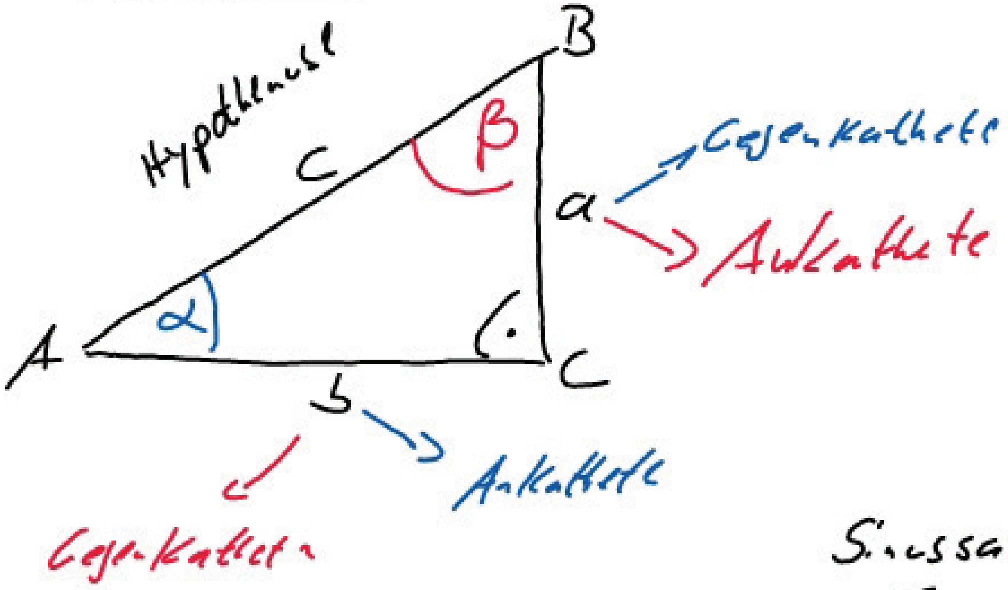
$z = 3$

$S(1\,|\,2\,|\,3)$

Trigonometrie

Pythagoras $c^2 = a^2 + b^2$





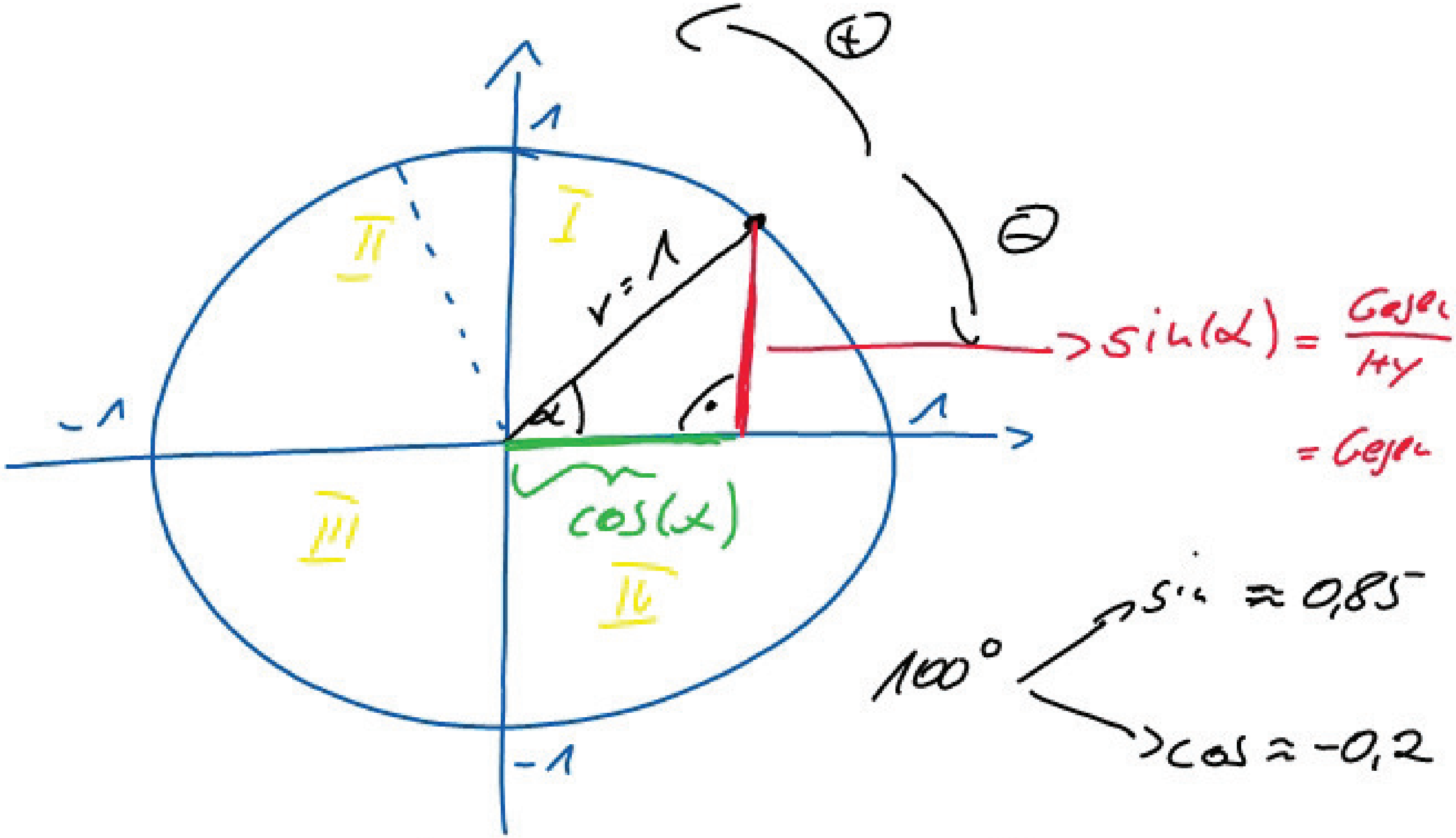
$$\sin(\alpha) = \frac{\text{Gegen}}{\text{Hyp}}$$

$$\cos(\alpha) = \frac{\text{An}}{\text{Hyp}}$$

Sinussatz: $\frac{\sin(\alpha)}{a} = \frac{\sin(\beta)}{b} = \frac{\sin(\gamma)}{c}$

nicht rechtwinkliges △: → Sinussatz, → Cosinussatz

$$c^2 = a^2 + b^2 - 2ab\cos(\gamma)$$

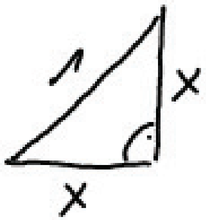


$100° \to \sin \approx 0{,}85$

$100° \to \cos \approx -0{,}2$

$\sin(\alpha) = \cos(\alpha) \to 45°;\ 225°$

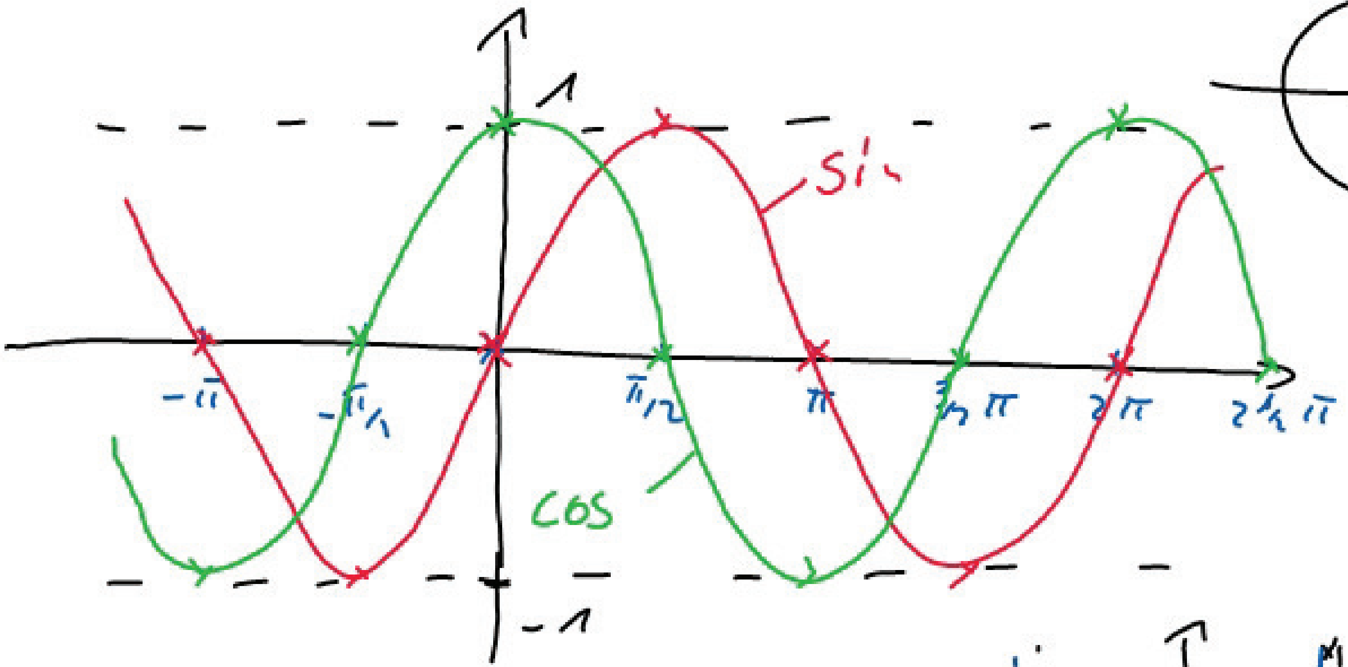
$\sin(45°)$

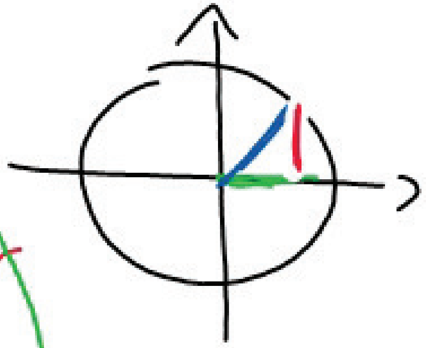


$$x^2 + x^2 = 1^2$$

$$2x^2 = 1$$

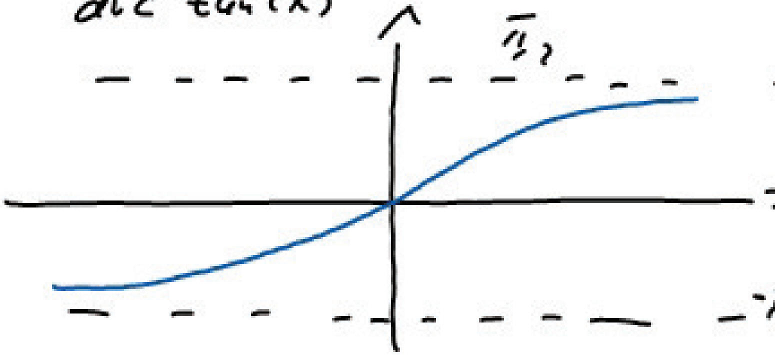
$$x = 1/\sqrt{2}$$

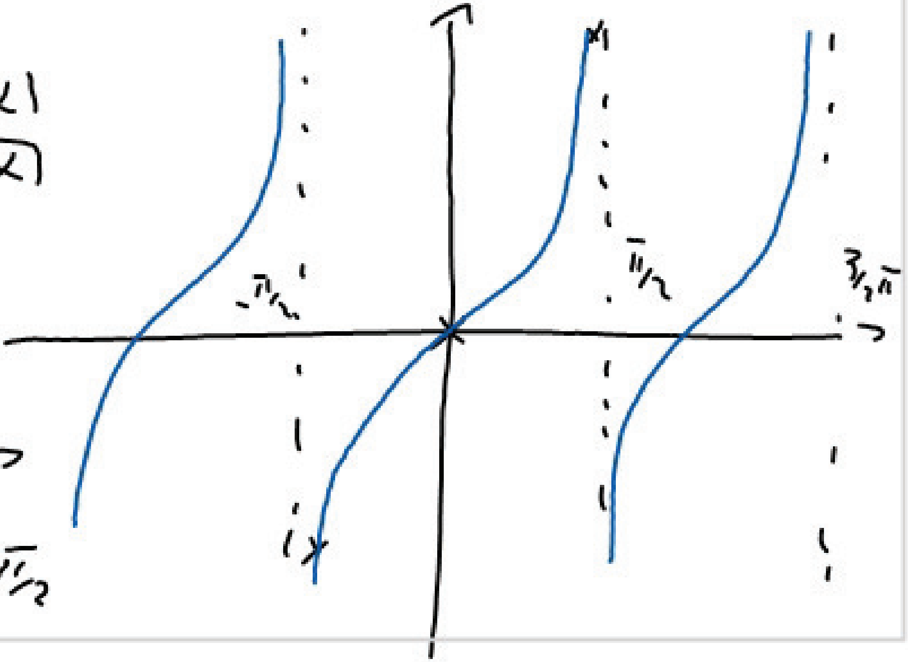




$$\tan(\alpha) = \frac{Gegen}{An} = \frac{\sin(\alpha)}{\cos(\alpha)}$$

arc tan(x)





1) $\sin(4x - 9{,}5\pi)$

$$9{,}5\pi = 4 \cdot 2\pi + \tfrac{3}{2}\pi$$
$$= \tfrac{3}{2}\pi$$

$$\sin(4x) \cdot \underbrace{\cos(\tfrac{3}{2}\pi)}_{0} - \underbrace{\sin(\tfrac{3}{2}\pi)}_{(-1)} \cdot \cos(4x) = \cos(4x)$$

2) $\cos(\tfrac{1}{2}x + 22{,}5\pi)$

$$22{,}5\pi \Rightarrow \tfrac{\pi}{2}$$

$$\cos(\tfrac{1}{2}x) \cdot \underbrace{\cos(\tfrac{\pi}{2})}_{0} - \underbrace{\sin(\tfrac{\pi}{2})}_{1} \cdot \sin(\tfrac{1}{2}x) = -\sin(\tfrac{1}{2}x)$$

=> Bei Addition von ??,5 π ändert sich
sin -> cos oder cos -> sin.