

S 210

$$\text{I a) } \begin{cases} 2x - y = -7 \\ 3x + 4y = 6 \end{cases} \Leftrightarrow \begin{cases} y = 2x + 7 \\ y = -\frac{3}{4}x + \frac{6}{4} \end{cases} \rightarrow S(-2|3)$$

$$\text{b) } \begin{cases} y - 2x = 4 \\ x + 3y = -9 \end{cases} \Leftrightarrow \begin{cases} y = 2x + 4 \\ y = -\frac{1}{3}x - 3 \end{cases} \rightarrow S(-3|-2)$$

$$\text{II a) } \begin{cases} x + 3y = 25 \\ 4x - y = 22 \end{cases} \quad x = 25 - 3y \quad \text{Einsetzung}$$

$$\begin{aligned} 4 \cdot (25 - 3y) - y &= 100 - 13y = 22 & | -100 \\ -13y &= -78 & | : -13 \\ y &= 6 \end{aligned}$$

$$x = 25 - 3 \cdot 6 = 7$$

$$S(7|6)$$

$$\begin{array}{l}
 c) \\
 \begin{array}{c|c|c}
 -5 = 0,25 y + 0,5 x & \cdot 4 & -20 = y + 2x \\
 \hline
 2y + 4x = 100 & \cdot \frac{1}{2} & y + 2x = 50
 \end{array}
 \end{array}
 \begin{array}{c|c}
 \hline \\
 \hline \\
 \hline \\
 \hline \\
 \hline \\
 \hline
 \end{array}
 \begin{array}{c}
 1-2x \\
 1-2x
 \end{array}$$

$$\begin{array}{c}
 \begin{array}{c|c}
 y = -2x - 20 \\
 y = -2x + 50
 \end{array} \\
 \text{Gleichsetzung:}
 \end{array}
 \begin{array}{c}
 -2x - 20 = -2x + 50 \quad | +2x \\
 -20 = 50 \quad \text{!}
 \end{array}$$

$$\mathcal{L} = \{ \}$$

$$\begin{array}{l}
 d) \\
 \begin{array}{c|c|c}
 3y - 2x = 13 \\
 \hline
 8x + 4y = -4
 \end{array}
 \cdot \frac{1}{4}
 \Leftrightarrow
 \begin{array}{c|c|c}
 -2x + 3y = 13 \\
 \hline
 2x + y = -1
 \end{array}
 \begin{array}{c}
 \downarrow + \\
 \downarrow +
 \end{array}
 \end{array}$$

$$\begin{array}{c}
 \begin{array}{c|c}
 -2x + 3y = 13 \\
 \hline
 4y = 12
 \end{array}
 \cdot \frac{1}{4} \quad y = 3
 \end{array}
 \begin{array}{c}
 \leftarrow \\
 \leftarrow \\
 \leftarrow \\
 \leftarrow
 \end{array}
 \begin{array}{c}
 -2x + 9 = 13 \quad | -9 \\
 -2x = 4 \quad | \cdot (-\frac{1}{2}) \\
 x = -2
 \end{array}$$

$$S(-2, 3)$$

S 211

$$a) \begin{cases} -x + 2y - 3z = -8 \\ 2x - y + 3z = 7 \\ 4x + 3y - z = -3 \end{cases} \begin{matrix} | \cdot 2) \\ | \cdot 4) \end{matrix} \quad \text{Pivot}$$

$$\begin{cases} -x + 2y - 3z = -8 \\ 0 \quad 3y - 3z = -9 \\ 0 \quad 11y - 13z = -35 \end{cases} \begin{matrix} | \cdot (-\frac{1}{3}) \end{matrix} \quad \text{Pivot}$$

$$\begin{cases} -x + 2y - 3z = -8 \\ 0 \quad 3y - 3z = -9 \\ 0 \quad 0 \quad -2z = -2 \end{cases} \begin{matrix} -x - 4 - 3 = -8 & x = 1 \\ 3y - 3 = -9 & y = -2 \\ z = 1 \end{matrix}$$

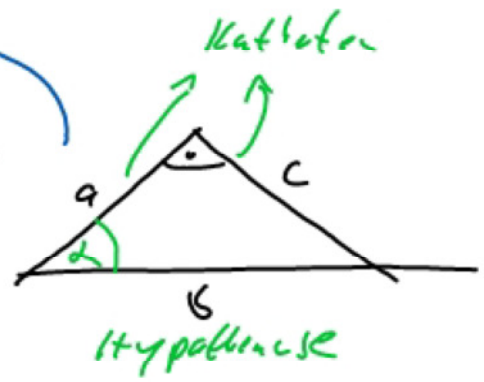
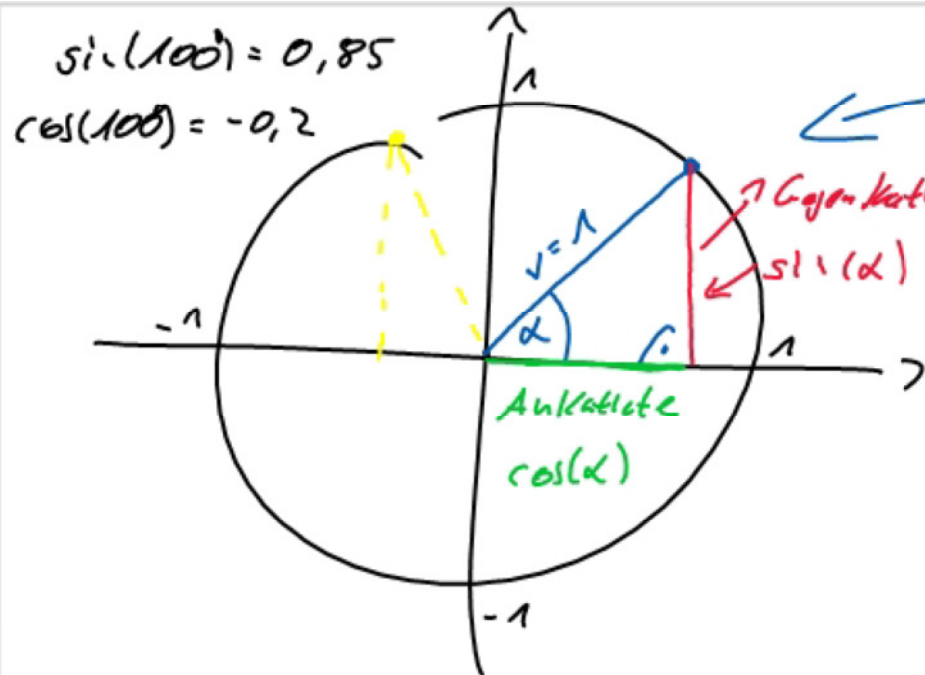
S(1|-2|1)

$$c) \begin{array}{l} \left| \begin{array}{ccc|c} x & -3y & +z & = -2 \\ -x & +2y & -3z & = -6 \\ 2x & +y & +4z & = 16 \end{array} \right| \begin{array}{l} \swarrow + \\ \searrow + \end{array} \quad \begin{array}{l} 1 \cdot (-2) \\ \end{array} \quad \text{Pivot} \end{array}$$

$$\begin{array}{l} \left| \begin{array}{ccc|c} x & -3y & +z & = -2 \\ 0 & -y & -2z & = -8 \\ 0 & 7y & +2z & = 20 \end{array} \right| \begin{array}{l} \swarrow + \\ \searrow + \end{array} \quad \text{Pivot} \end{array}$$

$$\begin{array}{l} \left| \begin{array}{ccc|c} x & -3y & +z & = -2 \\ 0 & -y & -2z & = -8 \\ 0 & 6y & 0 & = 12 \end{array} \right| \quad \begin{array}{l} y - 6 + 3 = -2 \Leftrightarrow x = 1 \\ 1:6 \quad y = 2 \quad \begin{array}{l} \swarrow -2 - 2z = -8 \Rightarrow z = 3 \\ \searrow \end{array} \end{array} \end{array}$$

$$S(1 \ 12 \ 13)$$



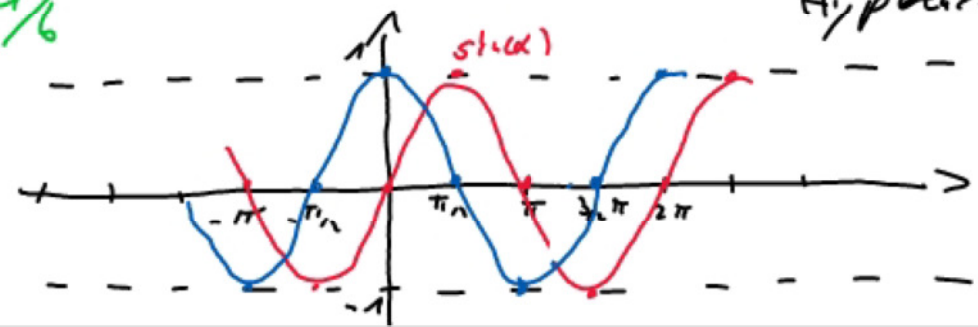
$$a^2 + c^2 = b^2$$

$$\sin(\alpha) = \frac{c}{b}$$

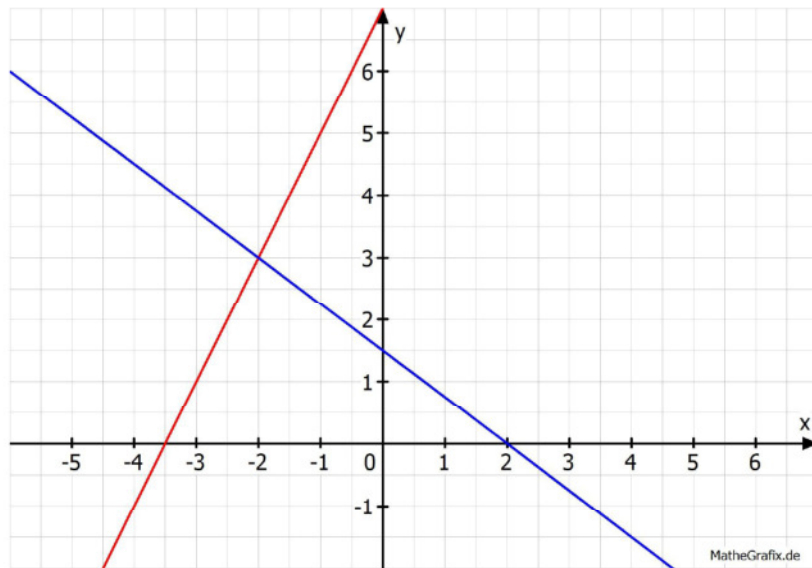
$$\cos(\alpha) = \frac{a}{b}$$

$$\sin(\alpha) = \frac{\text{Gegenkathete}}{\text{Hypotenuse}}$$

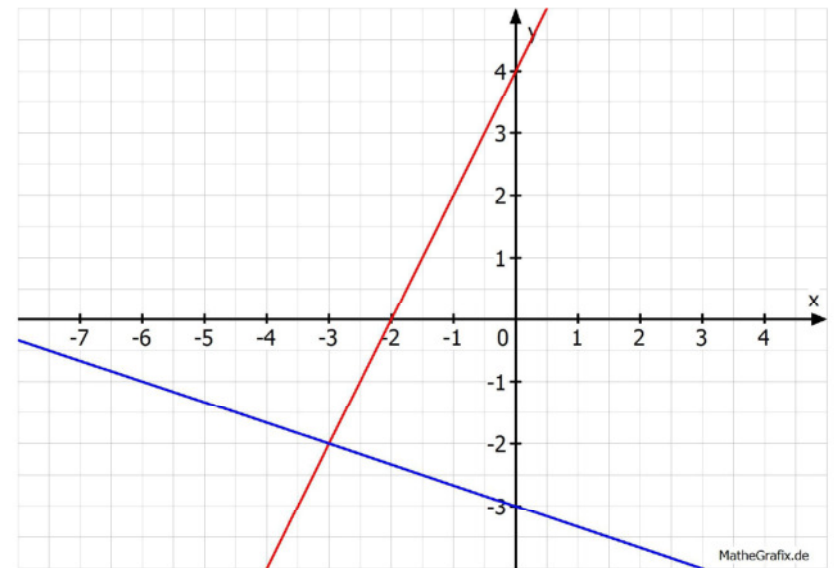
$$\cos(\alpha) = \frac{\text{Ankathete}}{\text{Hypotenuse}}$$



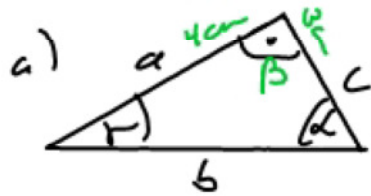
Seite 210 I. a)



Seite 210 I. b)



216. III



$$a^2 + c^2 = b^2 \Leftrightarrow 4^2 + 3^2 = 25 = 5^2 \quad b=5$$

$$\sin \gamma = \frac{c}{b} = \frac{3}{5} \quad \gamma = \arcsin\left(\frac{3}{5}\right) = 36,87^\circ$$

$$\cos \alpha = \frac{c}{b} \Rightarrow \alpha = \arccos\left(\frac{3}{5}\right) = 53,13^\circ$$

$$\text{Probe: } \alpha + \beta + \gamma = 180^\circ = 90^\circ + 36,87^\circ + 53,13^\circ \quad \checkmark$$

IV



$$\frac{\sin 20^\circ}{5c} = \frac{\sin \beta}{6c} \quad \text{SINUS-Satz}$$

$$\sin \beta = 6 \cdot \frac{\sin(20^\circ)}{5} = 0,411$$

$$\beta = \arcsin(0,411) = 24,2^\circ$$

$$\alpha = 180^\circ - (20^\circ + 24,2^\circ) = 135,8^\circ$$

Winkelsumme

$$a^2 = b^2 + c^2 - 2 \cdot b \cdot c \cdot \cos(\alpha) = 36 + 25 - 60 \cdot \cos(135,8^\circ) = 104$$

cosinus-Satz

$$\Rightarrow a = \sqrt{104} = 10,2$$

IV s.



$$h: \sin(20^\circ) = \frac{h}{6} \quad | \cdot 6$$
$$\sin(20^\circ) \cdot 6 = h$$
$$h = 2,05$$

$$\Rightarrow A = \frac{1}{2} \cdot g \cdot h$$

$$A = \frac{1}{2} \cdot 10,4 \cdot 2,05$$

$$A = 10,66 \text{ cm}^2$$

$$U = a + b + c$$

$$U = 5 + 6 + 10,4$$

$$U = 21,4 \text{ cm}$$