

Lösungen „Weiterführende Übungen 2“

1. Aufgabe

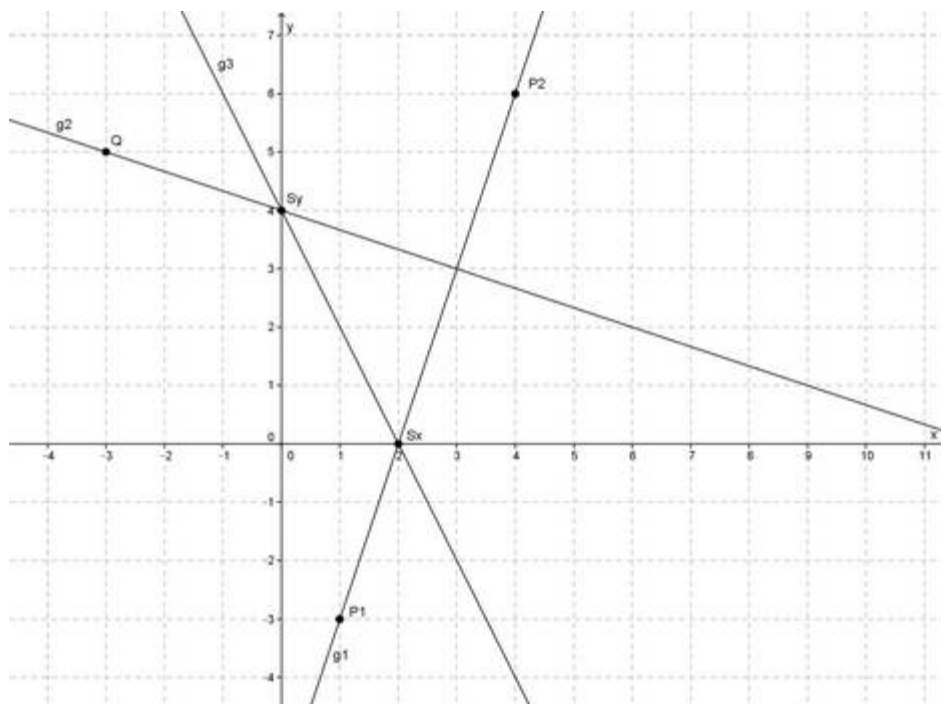
$$\begin{array}{ll}
 m = -1 & m = 1 \\
 \text{a) } b = 5 & b = 2 \\
 g_1(x) = -x + 5 & g_2(x) = x + 2
 \end{array}$$

$$\begin{array}{ll}
 g_1(x) = g_2(x) & \\
 -x + 5 = x + 2 \quad | +x - 2 & g_1(1,5) = 3,5 \\
 3 = 2x \quad | : 2 & \text{Probe: } g_2(1,5) = 3,5 \\
 x = 1,5 & S(1,5|3,5)
 \end{array}$$

$$\begin{array}{ll}
 O(0|0) & \\
 \text{c) } S(1,5|3,5) & d = \sqrt{(1,5 - 0)^2 + (3,5 - 0)^2} \\
 d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} & d = 3,8 \text{ LE}
 \end{array}$$

2. Aufgabe

a)



$$\begin{array}{ll}
 m = \frac{y_2 - y_1}{x_2 - x_1} & y = m \cdot x + b \\
 \text{b) } m = \frac{6 - 3}{4 - 1} & 6 = 3 \cdot 4 + b \quad | - 12 \\
 m = 3 & b = -6 \\
 & g_1(x) = 3x - 6
 \end{array}$$

$$y = m \cdot x + b$$

$$5 = -\frac{1}{3} \cdot (-3) + b \quad | -1$$

$$b = 4$$

$$g_2(x) = -\frac{1}{3}x + 4$$

$$g_1 : S_x(2|0)$$

$$g_2 : S_y(0|4) \Rightarrow b = 4$$

$$m = \frac{4-0}{0-2}$$

$$m = -2$$

$$g_3(x) = -2x + 4$$

$$\tan(\alpha) = m$$

$$\tan^{-1}(m) = \alpha$$

$$m_1 = 3$$

$$\tan^{-1}(3) = \alpha_1$$

$$\alpha_1 = 71,6^\circ$$

$$m_2 = -\frac{1}{3}$$

$$\tan^{-1}\left(-\frac{1}{3}\right) = \alpha_2$$

$$\alpha_2 = -18,4^\circ$$

$$m_3 = -2$$

$$\tan^{-1}(-2) = \alpha_3$$

$$\alpha_3 = -63,4^\circ$$

$$g_1(x) = g_2(x)$$

$$3x - 6 = -\frac{1}{3}x + 4 \quad | +\frac{1}{3}x + 6$$

c)

$$\frac{10}{3}x = 10 \quad | : \frac{10}{3}$$

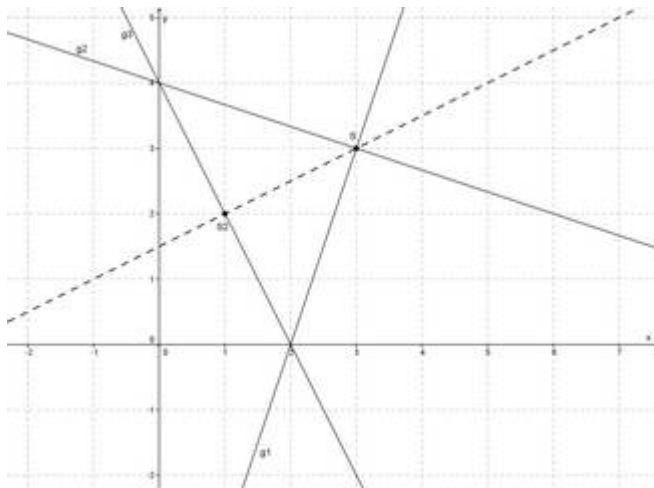
$$x = 3$$

$$g_1(3) = 3$$

$$\text{Probe: } g_2(3) = 3$$

$$S(3|3)$$

d)



$$m_1 \cdot m_2 = -1$$

$$m_1 = -2$$

$$m_2 = \frac{1}{2}$$

$$P(3|3)$$

$$y = m \cdot x + b$$

$$3 = \frac{1}{2} \cdot 3 + b \quad | -\frac{3}{2}$$

$$b = 1,5$$

$$o(x) = \frac{1}{2}x + 1,5$$

$$g_3(x) = o(x)$$

$$-2x + 4 = \frac{1}{2}x + 1,5 \quad \left| -\frac{1}{2}x - 4 \right. \quad g_1(1) = 2$$

$$-2,5x = -2,5 \quad | :(-2,5)$$

$$x = 1$$

$$S(3|3)$$

$$S_2(1|2)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$S_2(1|2)$$

$$d = \sqrt{(1-3)^2 + (2-3)^2}$$

$$d = 2,2 \quad \text{LE}$$

3. Aufgabe

Gerade g_1

$$\tan(\alpha) = m$$

$$\tan(71,6^\circ) = m$$

$$m = 3$$

$$S_y(0|8)$$

$$m = 3$$

$$g_1(x) = 3x + 8$$

Gerade g_2

$$m_1 = m_2$$

$$m_1 = 3$$

$$m_2 = 3$$

$$S_x(4|0)$$

$$y = m \cdot x + b$$

$$0 = 3 \cdot 4 + b \quad | -12$$

$$b = -12$$

$$g_2(x) = 3x - 12$$

Orthogonale

$$m_1 \cdot m_2 = -1$$

$$m_1 = 3$$

$$m_2 = -\frac{1}{3}$$

$$S_1(0|8)$$

$$o(x) = -\frac{1}{3}x + 8$$

$$g_2(x) = o(x)$$

$$3x - 12 = -\frac{1}{3}x + 8 \quad \left| +\frac{1}{3}x + 12 \right.$$

$$\frac{10}{3}x = 20 \quad \left| : \frac{10}{3} \right.$$

$$x = 6$$

$$g_2(6) = 6$$

$$\text{Probe: } o(6) = 6$$

$$S_2(6|6)$$

$$S_1(0|8)$$

$$S_2(6|6)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(6-0)^2 + (6-8)^2}$$

$$d = 6,3 \quad \text{LE}$$