

3.1

$$\begin{aligned} \frac{\begin{cases} 3x - 6y = 2 \\ -3x + y = 3 \end{cases}}{-5y = 5} & \quad \text{add} \\ \Rightarrow y = -1 & \quad \Rightarrow 3x - 6(-1) = 2 \quad \Rightarrow x = -\frac{4}{3} \end{aligned}$$

$\frac{1}{2} \rightarrow \frac{1}{2}$

$$\Rightarrow 3x - 6(-1) = 2 \quad (\Rightarrow) x = -\frac{4}{3}$$

$$\begin{cases} 3x - 2t = 10 & (1) \\ x + 6t = 0 & (2) \\ 2x + 4t = 4 & (3) \end{cases} \quad (1) \cdot 8 \cdot (2) : \begin{cases} 3x - 2t = 10 \\ x + 6t = 0 \quad | \cdot (-3) \\ -20t = 10 \quad | : (-20) \end{cases} \quad t = -\frac{1}{2}$$

$$\begin{aligned} 2x + 4t &= 4 & (3) \\ -20t &= 10 & \Rightarrow t = -\frac{1}{2} \\ \Rightarrow 4 &= -6t = -6(-\frac{1}{2}) = 3 \\ \Rightarrow 4 &= 3 & \text{Contradiction} \end{aligned}$$

3.6

$$\begin{cases} 2x - 2x + 3k = -3 & (1) \\ 5x + 2k = 1 & (2) \\ 2x - x + k = -1 & (3) \end{cases}$$

$$(1) - 2 \cdot (3) : \begin{cases} -2x + k = -1 & | \cdot (-2) \\ 5x + 2k = 1 & \swarrow \text{Mj.} \end{cases}$$

$$g_n = 3^{n-1} \quad n=1, 2, 3, \dots$$

$$\Rightarrow k = -1 + 2n = -1 + 2 \cdot \frac{1}{3} = -\frac{1}{3}$$

3.11

$$\begin{aligned} a) \quad & \begin{cases} 2x + y = 0 & | \cdot (-3) \\ 6x - 5y = -8 & \text{iii} \end{cases} \\ & \quad \quad \quad -8y = -8 \quad | : (-8) \quad \text{iii} \\ & \quad \quad \quad y = 1 \\ & \Rightarrow 2x + 1 = 0 \quad | : 2 \quad \text{ii} \\ & \quad \quad \quad x = -\frac{1}{2} \\ \\ b) \quad & \begin{cases} 3x + y - 2 = 0 & | \cdot (-2) \\ 5x + 2y - 1 = 0 & \text{iii} \end{cases} \\ & \quad \quad \quad -x + 3 = 0 \quad | : (-1) \quad \text{ii} \\ & \quad \quad \quad x = 3 \\ & \Rightarrow y = 2 - 3 \cdot 3 = -7 \end{aligned}$$

$$A = (-6, -1), B = (2, 7)$$

$$k_f = \begin{pmatrix} -\frac{6+2}{2} & -\frac{1+7}{2} \end{pmatrix} = \begin{pmatrix} -2 & 3 \end{pmatrix}$$

$$|C_0| = \sqrt{(-2-0)^2 + (3-0)^2} = \sqrt{4+9} = \sqrt{13}$$

4,3

$$O = (0, 0), \quad C = (12, -5), \quad A = (x, y)$$

$$M_G = C = \left(\frac{0+x}{2}, \frac{0+y}{2} \right) = \left(\frac{x}{2}, \frac{y}{2} \right) = (12, -5)$$

$$\Rightarrow \begin{cases} x = 12 & | \cdot 2 \quad (=) \quad x = 24 \\ y = -5 & | \cdot 2 \quad (=) \quad x = -10 \end{cases} \Rightarrow \underline{\underline{A = (24, -10)}}$$

$$|AB| = \sqrt{(x-2)^2 + (0-(-4))^2} = 5 \quad |1|^2 \text{ mod. } \geq 0$$

$$\begin{aligned} \text{iii)} \quad & x - 2 = 3 \quad \text{ii)} \quad x = 5 \quad \text{iv)} \quad x = -1 \end{aligned}$$

$A = (-1, 0)$ for $A = (5, 0)$

$$b) |AC| = |BC|$$

$$C = (x, 0)$$

$$B = (500, -100)$$

$$= \sqrt{(x-500)^2 + (0-(-100))^2}$$

$$\frac{2}{(1), \text{ med. good. } 7, 0}$$

$$C = (X - 300)^2 + 40000 = (X - 500)^2 + 100000$$

$$\begin{aligned} \text{(=)} \quad X^2 - 600X + 30\,000 + 40\,000 &= X^2 - 1000X + 250\,000 + 10\,000 \\ \text{(=)} \quad 400X = 130\,000 &\quad \text{(=)} \quad X = 325 \quad \Rightarrow \quad C = (325, 0) \end{aligned}$$

$$|2(-4) + a| = 5 \quad (\Rightarrow) |-8 + a| = 5$$

$$\begin{array}{r} 29 \\ 29 \\ \hline 58 \end{array}$$

$$k_n = \frac{\partial \Gamma}{\partial x} = \frac{2-1}{1-1} = 1 \Rightarrow k_n \text{ ei määritelly}$$