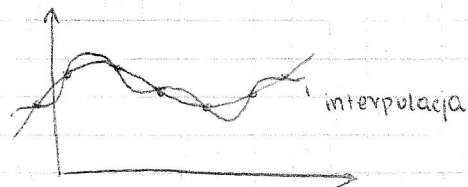


Metoda Newtona (stycznych)

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$



$$f(x) = 3x^2 + 2x - 3$$

$$f(1) = -4$$

$$f'(1) = 2$$

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 1 - \frac{-4}{2} = 3$$

$$f(3) = 3 \cdot 3^2 + 2 \cdot 3 - 3 = 24$$

$$f'(3) = 30$$

$$x_2 = 3 - \frac{24}{30} = 2,2$$

$$f(2,2) = 5,888$$

$$f'(2,2) = 15,92$$

$$x_3 = 1,8302$$

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$$2x_1 + 2x_2 + 3x_3 = 3$$

$$x_1 - x_2 = -1$$

$$-x_1 + 2x_2 + x_3 = 2$$

Metoda Gaussa

$$\begin{bmatrix} 2 & 2 & 3 \\ 1 & -1 & 0 \\ -1 & 2 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 3 \\ -1 \\ 2 \end{bmatrix}$$

$$A \cdot x = b$$

$$\det(A)$$

$$x_i = \frac{\det(W_i)}{\det(A)} \quad i=1,2,\dots,n$$

$$A_n = \begin{bmatrix} 2 & 2 & 3 & 3 \\ 1 & -1 & 0 & -1 \\ -1 & 2 & 1 & 2 \end{bmatrix}$$

$$I \quad w_2' = w_2 - \frac{1}{2}w_1; \quad w_3' = w_3 + \frac{1}{2}w_1$$

$$\begin{bmatrix} 2 & 2 & 3 & 3 \\ 0 & -2 & -\frac{3}{2} & -\frac{5}{2} \\ 0 & \frac{5}{2} & \frac{7}{2} \end{bmatrix}$$

$$II \quad w_3' = w_3 + \frac{3}{2}w_2$$

$$\begin{bmatrix} 2 & 2 & 3 & 3 \\ 0 & -2 & -\frac{3}{2} & -\frac{5}{2} \\ 0 & 0 & \frac{1}{4} & -\frac{1}{4} \end{bmatrix}$$

$$\begin{cases} 2x_1 + 2x_2 + 3x_3 = 3 \\ -2x_2 - \frac{3}{2}x_3 = -\frac{5}{2} \\ \frac{1}{4}x_3 = -\frac{1}{4} \end{cases}$$

$$\begin{aligned} x_3 &= -1 \\ -2x_2 - \frac{3}{2}(-1) &= -\frac{5}{2} \\ -2x_2 + \frac{3}{2} &= -\frac{5}{2} \\ -2x_2 &= -\frac{5}{2} - \frac{3}{2} = -4 \\ x_2 &= 2 \end{aligned}$$

$$\begin{aligned} 2x_1 + 2 \cdot 2 + 3 \cdot (-1) &= 3 \\ 2x_1 + 4 - 3 &= 3 \\ 2x_1 + 1 &= 3 \\ 2x_1 &= 2 \\ x_1 &= 1 \end{aligned}$$

$$x = \begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$$