Latihan soal

1. Diketahui data - data berikut : (0,-6) ; (2,4) ; (4,10) tentukan perkiraan dari f(1)

Penyelesaian:

Maju

$f(x) \approx P_2(x) = f(x_0) + \Delta f(x_0) \cdot s + \frac{\Delta^2 f(x_0)}{2!} \cdot s(s-1)$

x	f(x)	$\Delta f(x)$	$\Delta^2 f(x)$
0	-6	10	
2	4		-4
4	10	6	

$f(x_0)$ → -6

$\Delta f(x_0)$ → 10

$\Delta^2 f(x_0)$ → -4

$h = 2$

$s = \frac{x-0}{2} = \frac{x}{2}$

$f(x) \approx P_2(x) = f(x_0) + \Delta f(x_0) \cdot s + \frac{\Delta^2 f(x_0)}{2!} \cdot s(s-1)$

$= -6 + 10 \cdot \frac{x}{2} + \frac{-4}{2} \cdot \frac{x}{2}\left(\frac{x}{2} - 1\right)$

$f(1) \approx -6 + 10 \cdot \frac{1}{2} + \frac{-4}{2} \cdot \frac{1}{2}\left(\frac{1}{2} - 1\right)$

$\approx -0{,}5$

Mundur

$f(x) \approx P_2(x) = f(x_2) + \nabla f(x_2) \cdot s + \frac{\nabla^2 f(x_2)}{2!} \cdot s(s+1)$

x	f(x)	$\nabla f(x)$	$\nabla^2 f(x)$
0	-6		
		10	
2	4		-4
		6	
4	10		

$h = 2$

$s = \frac{x-4}{2} =$

$f(x_2)$ → 10

$\nabla f(x_2)$ → 6

$\nabla^2 f(x_2)$ → -4

Date:

$$f(x) \approx P_2(x) = f(x_2) + \nabla f(x_2) \cdot s + \frac{\nabla^2 f(x_2)}{2!} \cdot s(s+1)$$

$$= 10 + 6\left(\frac{x-4}{2}\right) + \frac{-4}{2} \cdot \left(\frac{x-4}{2}\right)\left(\frac{x-4}{2}+1\right)$$

$$= 10 + 6\left(\frac{x-4}{2}\right) + (-2) \cdot \left(\frac{x-4}{2}\right)\left(\frac{x-4}{2}+1\right)$$

$$f(1) \approx 10 + 6\left(\frac{1-4}{2}\right) - 2 \cdot \left(\frac{1-4}{2}\right)\left(\frac{1-4}{2}+1\right)$$

$$\approx 10 + 6\left(\frac{-3}{2}\right) - 2\left(\frac{-3}{2}\right)\left(\frac{-3}{2}+1\right)$$

$$\approx -0{,}5$$