

Diketahui data - data berikut:  
(0,6); (2,4); (4,10)

Tentukan perkiraan dari f(u)

Penyelesaian:

Newton Gregory 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 $f(x_0)$	10 $\Delta f(x_0)$	-4 $\Delta^2 f(x_0)$
2	4	6 $\Delta f(x_1)$	
4	10 $f(x_2)$		

$$h = 2$$

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

$$f(x) \approx P_2(x) = -6 + 10 \cdot \left(\frac{x}{2}\right) + \left(-\frac{4}{2}\right) \cdot \left(\frac{x}{2}\right) \left(\frac{x}{2} - 1\right)$$

$$f(u) \approx P_2(u)$$

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

$$\approx -6 + 5 + \left(-\frac{4}{2}\right) \left(\frac{1}{2}\right) \left(-\frac{1}{2}\right)$$

$$\approx -6 + 5 + (-2) \left(-\frac{1}{4}\right)$$

$$\approx -6 + 5 + \frac{1}{2}$$

$$\approx \frac{-12 + 10 + 1}{2}$$

$$\approx -\frac{1}{2}$$

o Newton Gregory Mundur

$$h = 0$$

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

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

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

$$f(1) \approx P_2(1)$$

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

$$\approx 10 + 6 \cdot \left(-\frac{3}{2}\right) + \left(-\frac{4}{2}\right) \cdot \left(-\frac{3}{2}\right) \left(-\frac{3}{2} + 1\right)$$

$$\approx 10 - 9 + \left(-\frac{4}{2}\right) \cdot \left(-\frac{3}{2}\right) \left(-\frac{1}{2}\right)$$

$$\approx 10 - 9 + \left(-\frac{12}{8}\right)$$

$$\approx \frac{80 - 72 - 12}{8}$$

$$\approx -\frac{4}{8}$$

$$\approx -\frac{1}{2}$$