Taller 22 - Daniel Amado

$f(5)$

	x	f(x)
	0	4
$X_0 \rightarrow$	2	2,5
$X_1 \rightarrow$	4	6
$X_2 \rightarrow$	6	10,2
	8	11,8

Grado 1

$$f_1(x) = \frac{x - x_1}{x_0 - x_1} f(x_0) + \frac{x - x_0}{x_1 - x_0} f(x_1) \rightarrow f_1(x) = \frac{x-6}{4-6}(6) + \frac{x-4}{6-4}(10,2)$$

$$f_1(x) = -3(x-6) + 5,1(x-4) \rightarrow f_1(x) = -3x + 18 + 5,1x - 20,4$$

$$f_1(x) = 2,1x - 2,4$$

Estimando $\rightarrow$ $f_1(5) = 2,1(5) - 2,4 \Rightarrow f_1(5) = 8,1$

Grado 2.

$$f_2(x) = \left(\frac{x-x_1}{x_0-x_1} \cdot \frac{x-x_2}{x_0-x_2}\right) f(x_0) + \left(\frac{x-x_0}{x_1-x_0} \cdot \frac{x-x_2}{x_1-x_2}\right) f(x_1) + \left(\frac{x-x_0}{x_2-x_0} \cdot \frac{x-x_1}{x_2-x_1}\right) \cdot f(x_2)$$

$$f_2(x) = \left(\frac{x-4}{2-4} \cdot \frac{x-6}{2-6}\right)(2,5) + \left(\frac{x-2}{4-2} \cdot \frac{x-6}{4-6}\right)(6) + \left(\frac{x-2}{6-2} \cdot \frac{x-4}{6-4}\right)(10,2)$$

$$f_2(x) = \frac{5}{16}(x^2 - 10x + 24) - \frac{3}{2}(x^2 - 8x + 12) + \frac{51}{40}(x^2 - 6x + 8)$$

$$f_2(x) = \frac{5}{16}x^2 - \frac{25}{8}x + \frac{15}{2} - \frac{3}{2}x^2 + 12x - 18 + \frac{51}{40}x^2 - \frac{153}{20}x + \frac{51}{5}.$$

$$f_2(x) = \frac{7}{80}x^2 + \frac{49}{40}x - \frac{3}{10} \rightarrow f_2(x) = 0,0875x^2 + 1,225x - 0,3$$

Estimando $\rightarrow$ $f_2(5) = 0,0875(5)^2 + 1,225(5) - 0,3 \rightarrow f_2(5) = 8,0125.$

Grado 3.

$X_0 \rightarrow$	0	4
$X_1 \rightarrow$	2	2,5
$X_2 \rightarrow$	4	6
$X_3 \rightarrow$	6	10,2

$$f_3(5) = \frac{(5-2)(5-4)(5-6)}{(0-2)(0-4)(0-6)}(4) + \frac{(5-0)(5-4)(5-6)}{(2-0)(2-4)(2-6)}(2,5) + \frac{(5-0)(5-2)(5-6)}{(4-0)(4-2)(4-6)}(6) + \frac{(5-0)(5-2)(5-4)}{(6-0)(6-2)(6-4)}(10,2)$$

$$f_3(5) = (4)\left(\frac{-3}{-48}\right) + (2,5)\left(\frac{-5}{16}\right) + (6)\left(\frac{-15}{-16}\right) + (10,2)\left(\frac{15}{48}\right)$$

$$f_3(5) = (4)\left(\frac{1}{16}\right) + (2,5)\left(-\frac{5}{16}\right) + (6)\left(\frac{15}{16}\right) + (10,2)\left(\frac{5}{16}\right)$$

$$f_3(5) = \frac{1}{4} - \frac{25}{32} + \frac{45}{8} + \frac{51}{16}$$

$$f_3(5) = \frac{265}{32} = 8,28125$$