

Interpolar os pontos

(2, 1)

(4, 3)

(6, 2)

**Pela resolução de sistema linear:**

$$\begin{array}{ccc|c} m & A & b & \\ & 1 & 2 & 4 \quad | \quad 1 \\ 1 & 1 & 4 & 16 \quad | \quad 3 \\ 1 & 1 & 6 & 36 \quad | \quad 2 \end{array}$$

$$\begin{array}{ccc|c} & 1 & 2 & 4 \quad | \quad 1 \\ & 0 & 2 & 12 \quad | \quad 2 \\ 2 & 0 & 4 & 32 \quad | \quad 1 \end{array}$$

$$\begin{array}{ccc|c} & 1 & 2 & 4 \quad | \quad 1 \\ & 0 & 2 & 12 \quad | \quad 2 \\ & 0 & 0 & 8 \quad | \quad -3 \end{array}$$

Obtendo o vetor solução por substituição retroativa:

$$c = -3/8$$

$$2b + 12(-3/8) = 2 \quad \Rightarrow \quad 2b - 9/2 = 2 \quad \Rightarrow \quad 2b = 13/2 \quad \Rightarrow \quad b = 13/4$$

$$a + 2(13/4) + 4(-3/8) = 1 \quad \Rightarrow \quad a + 13/2 - 3/2 = 1 \quad \Rightarrow \quad a = -4$$

$$p(x) = -4 + 13x/4 - 3x^2/8$$

Conferindo o resultado

$$p(2) = -4 + 13/2 - 3/2 = -4 + 5 = 1 \text{ [ok]}$$

$$p(4) = -4 + 13 - 6 = 3 \text{ [ok]}$$

$$p(6) = -4 + 39/2 - 27/2 = -4 + 6 = 2 \text{ [ok]}$$

**Pelo polinômio de Lagrange**

$$l_0(x) = (x - 4)(x - 6)/(2 - 4)(2 - 6) = (x^2 - 10x + 24)/8$$

$$l_1(x) = (x - 2)(x - 6)/(4 - 2)(4 - 6) = (x^2 - 8x + 12)/(-4)$$

$$l_2(x) = (x - 2)(x - 4)/(6 - 2)(6 - 4) = (x^2 - 6x + 8)/8$$

$$P(x) = (x^2 - 10x + 24)/8 + 3(x^2 - 8x + 12)/(-4) + 2(x^2 - 6x + 8)/8$$

$$P(x) = x^2(1/8 - 3/4 + 1/4) + x(-10/8 + 24/4 - 12/8) + (24/8 - 36/4 + 16/8)$$

$$P(x) = x^2(1/8 - 3/4 + 1/4) + x(-5/4 + 6 - 3/2) + (3 - 9 + 2)$$

$$P(x) = x^2((1 - 6 + 2)/8) + x((-5 + 24 - 6)/4) - 4$$

$$P(x) = x^2(-3/8) + x(13/4) - 4$$