

1 - Encontre o polinômio interpolador do conjunto de pontos  $\{(0,1), (1,6), (2,5), (3,8)\}$   
R:

i	0	1	2	3
x	0	1	2	3
y	1	6	5	8

$$K = 4$$

$$N = k - 1 = 3$$

$$P_3(x) = a_0 + a_1x + a_2x^2 + a_3x^3$$

$$P_3(0) = a_0 + a_1(0) + a_2(0)^2 + a_3(0)^3 = 1$$

$$P_3(1) = a_0 + a_1(1) + a_2(1)^2 + a_3(1)^3 = 6$$

$$P_3(2) = a_0 + a_1(2) + a_2(2)^2 + a_3(2)^3 = 5$$

$$P_3(3) = a_0 + a_1(3) + a_2(3)^2 + a_3(3)^3 = 8$$

$$= a_0 + 0 + 0 + 0 = 1$$

$$= a_0 + a_1 + a_2 + a_3 = 6$$

$$= a_0 + 2a_1 + 4a_2 + 8a_3 = 5$$

$$= a_0 + 3a_1 + 9a_2 + 27a_3 = 8$$

$$\boxed{a_0 = 1}$$

$$a_1 + a_2 + a_3 = 5$$

$$2a_1 + 4a_2 + 8a_3 = 4$$

$$3a_1 + 9a_2 + 27a_3 = 7$$

$$2^*L_1 - L_2 \rightarrow$$

$$2a_1 + 2a_2 + 2a_3 = 10$$

$$\underline{-2a_1 - 4a_2 - 8a_3 = -4}$$

$$0 - 2a_2 - 6a_3 = 6$$

$$a_1 + a_2 + a_3 = 5$$

$$0 - 2a_2 - 6a_3 = 6$$

$$3a_1 + 9a_2 + 27a_3 = 7$$

$$3^*L_1 - L_3 \rightarrow$$

$$3a_1 + 3a_2 + 3a_3 = 15$$

$$\underline{-3a_1 - 9a_2 - 27a_3 = -7}$$

$$0 - 6a_2 - 24a_3 = 8$$

$$a_1 + a_2 + a_3 = 5$$

$$0 - 2a_2 - 6a_3 = 6$$

$$0 - 6a_2 - 24a_3 = 8$$

$$-3^*L_2 + L_3 \rightarrow$$

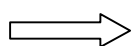
$$0 + 6a_2 + 18a_3 = -18$$

$$\underline{0 - 6a_2 - 24a_3 = 8}$$

$$0 + 0 - 6a_3 = -10 \Rightarrow \boxed{a_3 = +5/3}$$

$$\rightarrow -2a_2 - 6(5/3) = 6$$

$$-2a_2 - 10 = 6 \Rightarrow -2a_2 = 16 \Rightarrow \boxed{a_2 = -8}$$



$$a_1 - 8 + 5/3 = 5 \Rightarrow a_1 = 5 - 5/3 + 8 = +34/3$$

$$\text{Portanto o } P_3(x) = a_0 + a_1x + a_2x^2 + a_3x^3 = \boxed{1 + 34/3x - 8x^2 + 5/3x^3}$$