1)

Nº horas (x)	0	1	2	3	4
Volume de bactérias (Y)	32	47	65	92	132

Calcule: $P(3,7)$

$$\begin{cases} a.2^2 + b.2 + c = 65 \\ a.3^2 + b.3 + c = 92 \\ a.4^2 + b.4 + c = 132 \end{cases} \therefore \begin{cases} 4a + 2b + c = 65 \quad (1) \\ 9a + 3b + c = 92 \quad (2) \\ 16a + 4b + c = 132 \quad (3) \end{cases}$$

$(1) \rightarrow 4.6,5 + 2.(-5,5) + c = 65$

$c = 65 - 26 + 11$

$\boxed{c = 50}$

$$\begin{cases} 5a + b = 27 \rightarrow 5.6,5 + b = 27 \\ 7a + b = 40 \end{cases}$$

$b = 27 - 32,5$

$\boxed{b = -5,5}$

$2a = 13 \therefore \boxed{a = \frac{13}{2} = 6,5}$

$$\boxed{P_2(x) = 6,5x^2 - 5,5x + 50}$$

$P_2(3,7) = 6,5.3,7^2 - 5,5.3,7 + 50$

$P_2(3,7) = 118,635$

2)

	x_0 = 0	x_1 = 1	x_2 = 2	x_3 = 3
x	1,0	1,2	1,4	1,6
$f(x)$	2,718	3,320	4,055	4,953

$P_3(x) = L_0.f(x_0) + L_1.f(x_1) + L_2.f(x_2) + L_3.f(x_3)$

$$L_0 = \frac{(x-x_1)(x-x_2)(x-x_3)}{(x_0-x_1)(x_0-x_2)(x_0-x_3)} = \frac{(x-1,2)(x-1,4)(x-1,6)}{(1,0-1,2)(1,0-1,4)(1,0-1,6)} = \frac{(x-1,2)(x-1,4)(x-1,6)}{(-0,2)(-0,4)(-0,6)}$$

$$L_1 = \frac{(x-x_0)(x-x_2)(x-x_3)}{(x_1-x_0)(x_1-x_2)(x_1-x_3)} = \frac{(x-1,0)(x-1,4)(x-1,6)}{(1,2-1,0)(1,2-1,4)(1,2-1,6)} = \frac{(x-1,0)(x-1,4)(x-1,6)}{(0,2)(-0,2)(-0,4)}$$

$$L_2 = \frac{(x-x_0)(x-x_1)(x-x_3)}{(x_2-x_0)(x_2-x_1)(x_2-x_3)} = \frac{(x-1,0)(x-1,2)(x-1,6)}{(1,4-1,0)(1,4-1,2)(1,4-1,6)} = \frac{(x-1,0)(x-1,2)(x-1,6)}{(0,4)(0,2)(-0,2)}$$

$$L_3 = \frac{(x-x_0)(x-x_1)(x-x_2)}{(x_3-x_0)(x_3-x_1)(x_3-x_2)} = \frac{(x-1,0)(x-1,2)(x-1,4)}{(1,6-1,0)(1,6-1,2)(1,6-1,4)} = \frac{(x-1,0)(x-1,2)(x-1,4)}{(0,6)(0,4)(0,2)}$$

a) $P_3(x) = 2,718\left(\frac{(x-1,2).(x-1,4)(x-1,6)}{-0,048}\right) + 3,320\left(\frac{(x-1)(x-1,4)(x-1,6)}{(0,016)}\right) +$

$$4,055\left(\frac{(x-1)(x-1,2).(x-1,6)}{(-0,016)}\right) + 4,953\left(\frac{(x-1)(x-1,2)(x-1,4)}{(0,048)}\right)$$