Punto a)

$$\Omega = (x_0, f_0) ; (x_1, f_1) ; (x_2, f_2)$$

$$\left.\begin{array}{l} L_0 = \left(\dfrac{x-x_1}{x_0-x_1}\right)\left(\dfrac{x-x_2}{x_0-x_2}\right) \\ L_1 = \left(\dfrac{x-x_0}{x_1-x_0}\right)\left(\dfrac{x-x_2}{x_1-x_0}\right) \\ L_2 = \left(\dfrac{x-x_0}{x_2-x_0}\right)\left(\dfrac{x-x_1}{x_2-x_1}\right) \end{array}\right\} \quad P(x) = L_0 f_0 + L_1 f_1 + L_2 f_2$$

$$P(x) = \left[\left(\frac{x-x_1}{x_0-x_1}\right)\left(\frac{x-x_2}{x_0-x_2}\right)\right] f_0 + \left[\left(\frac{x-x_0}{x_1-x_0}\right)\left(\frac{x-x_2}{x_1-x_2}\right)\right] f_1 + \left[\left(\frac{x-x_0}{x_2-x_0}\right)\left(\frac{x-x_1}{x_2-x_1}\right)\right] f_2$$

$$p(x) \left[\frac{x^2 - xx_2 - xx_1 + x_1x_2}{(x_0^2 \underbrace{- x_0x_2 - x_1x_0 + x_1x_2}}\right] f_0 + \left[\frac{x^2 - xx_2 - xx_0 + x_0x_2}{(x_1^2 - x_1x_2 \underbrace{- x_1x_0 + x_0x_2}}\right] f_1 + \left[\frac{x^2 - xx_1 - xx_0 + x_1x_0}{(x_2^2 - x_2x_1 \underbrace{- x_0x_2 + x_1x_0}}\right] f_2$$

Punto b) :

$$p'(x) = \frac{2x - \overbrace{(x_2 - x_1)}^{h}}{x_0^2 - \underbrace{x_2(-x_0 + x_1)}_{h} - x_1x_0} \cdot f_0 + \frac{2x - \overbrace{(x_2 - x_0)}^{2h}}{x_1^2 - x_1x_2 - \underbrace{x_2(x_0 - x_1)}_{h}} f_1 + \frac{2x - \overbrace{(x_1 - x_0)}^{h}}{x_2^2 - x_2x_1 - \underbrace{x_0(x_1 - x_0)}_{h}} f_2$$

$$= \frac{2x - h}{x_0^2 - x_1x_0 - x_2h} f_0 + \frac{2x - 2h}{x_1^2 - x_1x_2 - x_2h} f_1 + \frac{2x - h}{x_2^2 - x_2x_1 - xh}$$

$$x_0 = x_1 \pm \sqrt{x_1^2 + 4 \cdot 1 \cdot x_2h}$$

$$x_0 = x_1 \pm \sqrt{x_1^2 + 4x_2h}$$