

$$1) \quad a) \quad \Omega = \left\{ (x_0, f(x_0)), (x_1, f(x_1)), (x_2, f(x_2)) \right\}$$

$$l_0(x) = \frac{(x-x_1)(x-x_2)}{(x_0-x_1)(x_0-x_2)}$$

$$l_1(x) = \frac{(x-x_0)(x-x_2)}{(x_1-x_0)(x_1-x_2)}$$

$$l_2(x) = \frac{(x-x_0)(x-x_1)}{(x_2-x_0)(x_2-x_1)}$$

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

$$b) \quad p'(x) = f(x_0) \frac{(2x - x_1 - x_2)}{(x_0-x_1)(x_0-x_2)} + f(x_1) \frac{(2x - x_0 - x_2)}{(x_1-x_0)(x_1-x_2)} + f(x_2) \frac{(2x - x_0 - x_1)}{(x_2-x_0)(x_2-x_1)}$$

$$p'(x_0) = f(x_0) \frac{(2x_0 - (x_0+h) - (x_0+2h))}{(-h)(-2h)} + f(x_1) \frac{(x_0 - (x_0+2h))}{(h)(-h)} + f(x_2) \frac{(x_0 - (x_0+h))}{(2h)(h)}$$