Question 3 $p(x) = Ax^2 + Bx + C$

Solving for A, B, C:

$$p_2(x_0) = Ax_0^2 + Bx_0 + C = a$$

$$p_2(x_1) = Ax_1^2 + Bx_1 + C = b$$

$$p_2'(x_1) = 2Ax_1 + B = c$$

- $A = \frac{c - B}{2x_1}$
- $\frac{c - B}{2x_1} x_1^2 + Bx_1 + C = \frac{cx_1}{2} + \frac{Bx_1}{2} + C = b$

$$\Rightarrow C = b - \frac{cx_1}{2} - \frac{Bx_1}{2}$$

- $Ax_0^2 + Bx_0 + C = Ax_0^2 + Bx_0 + b - \frac{cx_1}{2} - \frac{Bx_1}{2} = a$

$$= \frac{c - B}{2x_1} x_0^2 + Bx_0 + b - \frac{cx_1}{2} - \frac{Bx_1}{2} = a$$

$$\Rightarrow B(x_0 - x_1/2) + \frac{c}{2x_1} x_0^2 - \frac{B}{2x_1} x_0^2 + b - \frac{cx_1}{2}$$

$$= B(x_0 - x_1/2 - x_0^2/2x_1) + \frac{c}{2x_1} x_0^2 - \frac{cx_1}{2} + b$$

$$\Rightarrow B = \frac{a - \frac{c}{2x_1} x_0^2 - \frac{cx_1}{2} - b}{x_0 - x_1/2 - x_0^2/2x_1}$$

$$= \frac{2(a-b) - c\left(\frac{x_0^2}{x_1} - x_1\right)}{2x_0 - x_1 - x_0^2/x_1}$$

$$A = \frac{c - \left(\frac{2(a-b) - c(x_0^2/x_1 - x_1)}{2x_0 - x_1 - x_0^2/x_1}\right)}{2x_1}$$

$$C = b - \frac{cx_1}{2} - \frac{\left(\frac{2(a-b) - c(x_0^2/x_1 - x_1)}{2x_0 - x_1 - x_0^2/x_1}\right)}{2}$$