XC3: Prove that

$$G_\lambda(z) = \sum_{i=1}^{p} m_i {\alpha_i}^\lambda \frac{P(z)}{z - \alpha_i}$$

using Lagrange Interpolation formula, for the special case of all $m_i = 1$. (Hint: first prove $G_\lambda(\alpha_i) = {\alpha_i}^\lambda P'(\alpha_i)$)

XC4: Prove the same formula in XC3, but for the general case of $m_i \geq 1$, by Induction. (Hint: first prove base case for $\lambda = 0$, use P'/P.)