Q2

Note that using the substitution $y = x^{100}$ reduces $P(x)$ to $P^*(y) = A_0 + A_1 y + A_2 y^2$. The product of $R^*(y) = P^*(y)P^*(y)$ of these two polynomials is of degree 4 so to uniquely determine $R^*(y)$ we need 5 of its values. Thus, we evaluate $P^*(y)$ at 5 values of its argument x, by letting $x = -2, -1, 0, 1, 2$. We then obtain from these 5 values of $R^*(y)$ its coefficients, by solving the corresponding system of linear equation in coefficients $r_0, \ldots, r_4$ such that $R^*(j) = r_0 + r_1 x + \cdots + r_4 x$. Thus we solve the system $\sum_{j=0}^{4} r_j i^j = R^*(i) : -2 \leq i \leq 2$. We now form the polynomial $R^*(j) = r_0 + r_1 x + \cdots + r_4 x$ with thus obtained r_j and finally substitute back y with x^{100} obtaining $R(x) = P(x)P(x)$.