



$$q_0 = 1$$

$$q_1 = \begin{vmatrix} s_0 & 1 \\ s_1 & x \end{vmatrix} = \begin{vmatrix} 1 & 1 \\ \alpha & x \end{vmatrix} + \begin{vmatrix} 1 & 1 \\ \beta & x \end{vmatrix} + \dots$$

$$q_2 = \begin{vmatrix} s_0 & s_1 & 1 \\ s_1 & s_2 & x \\ s_2 & s_3 & x^2 \end{vmatrix} = \begin{vmatrix} 1 & \beta & 1 \\ \alpha & \beta^2 & x \\ \alpha^2 & \beta^3 & x^2 \end{vmatrix} + \begin{vmatrix} 1 & \gamma & 1 \\ \alpha & \gamma^2 & x \\ \alpha^2 & \gamma^3 & x^2 \end{vmatrix} + \dots$$

$$q_1 = (x-\alpha) + (x-\beta) + \dots = \sum (x-\alpha)$$

$$q_2 = \sum (\alpha-\beta) \begin{vmatrix} 1 & 1 & 1 \\ \alpha & \beta & x \\ \alpha^2 & \beta^2 & x^2 \end{vmatrix}$$

$$q_2 = \sum (\alpha-\beta)^2 (x-\alpha)(x-\beta)$$

$$q_2 = \sum (\alpha-\beta)^2$$

$$q_3 = \begin{vmatrix} s_0 & s_1 & s_2 & 1 \\ s_1 & s_2 & s_3 & x \\ s_2 & s_3 & s_4 & x^2 \\ s_3 & s_4 & s_5 & x^3 \end{vmatrix} = \sum \left\{ \begin{vmatrix} 1 & \beta & \gamma^2 & 1 \\ \alpha & \beta^2 & \gamma^3 & x \\ \alpha^2 & \beta^3 & \gamma^4 & x^2 \\ \alpha^3 & \beta^4 & \gamma^5 & x^3 \end{vmatrix} \right\}$$

$$\Delta(\alpha, \beta, \gamma)$$

$$\beta\gamma^2 + \beta^2\gamma + \gamma\alpha^2 + \gamma^2\alpha + \beta\gamma(\beta-\gamma) + \gamma\alpha(\gamma-\alpha) + \alpha\beta(\alpha-\beta)$$

$$\beta\gamma(\beta-\gamma) + \alpha(\beta-\gamma^2) + \alpha^2(\beta-\gamma)$$

$$(\beta-\gamma)(\gamma-\alpha)(\alpha-\beta) \begin{vmatrix} 1 & 1 & 1 \\ \alpha & \beta & \gamma \\ \alpha^2 & \beta^2 & \gamma^2 \end{vmatrix}$$

$$q_3 = \sum (\beta-\gamma)(\gamma-\alpha)(\alpha-\beta) (x-\alpha)(x-\beta)(x-\gamma)$$

$$\sum \Delta(\alpha_1, \alpha_2, \dots, \alpha_i) (x-\alpha_1)(x-\alpha_2) \dots (x-\alpha_i)$$