

$$g \cdot d = \sum_{l=0}^{\infty} \sum_{j=0}^2 b_{l-j} \cdot d_j x^l, \quad k+j=l$$

$$= \sum_{l=0}^{\infty} \sum_{j=0}^2 b_{l-j} d_j x^l$$

$j = l - k$
 $k = l - j$

$$= \sum_{l=0}^{\infty} \left(\sum_{j=0}^2 b_{l-j} d_j \right) x^l$$

$$\Rightarrow p(x) = \sum_{i=0}^{\infty} a_i x^i = \sum_{l=0}^{\infty} \left(\sum_{j=0}^2 b_{l-j} d_j \right) x^l + r_1 x + r_0$$

equate equal powers

$$a_i = \left(\sum_{j=0}^2 b_{i-j} d_j \right) + \begin{cases} r_0 & \text{if } i=0 \\ r_1 & \text{if } i=1 \\ 0 & \text{if } i \geq 2 \end{cases}$$

$n \geq i \geq 2$

$i=0$

$$a_0 = [b_{0-0} d_0 + b_{0-1} d_1 + b_{0-2} d_2] + r_0$$

b_0 b_{-1} b_{-2}

$$\therefore r_0 = a_0 - b_0 \cdot d_0$$