

$$n := 2$$

$$m := 0, 1 \dots (2n) - 1$$

$$F(m) := \left[\sum_{n=0}^{n-1} \left[\alpha_n (\beta_n)^m \right] \right]$$

$$F(m) \rightarrow \begin{bmatrix} \alpha_0 + \alpha_1 \\ \alpha_0 \cdot \beta_0 + \alpha_1 \cdot \beta_1 \\ \alpha_0 \cdot (\beta_0)^2 + \alpha_1 \cdot (\beta_1)^2 \\ \alpha_0 \cdot (\beta_0)^3 + \alpha_1 \cdot (\beta_1)^3 \end{bmatrix}$$

$$S(m) := \left(\int_{-1}^1 x^m dx \right)$$

$$S(m) \rightarrow \begin{pmatrix} 2 \\ 0 \\ \frac{2}{3} \\ 0 \end{pmatrix}$$

$$i := 0, 1 \dots n - 1$$

$$\alpha_i := 1 \quad \beta_i := 1$$

Given

$$S(m) = F(m)$$

$$\begin{pmatrix} a_i \\ b_i \end{pmatrix} := \text{Find}(\alpha_i, \beta_i)$$

$$a_i = \blacksquare$$

$$b_i = \blacksquare$$