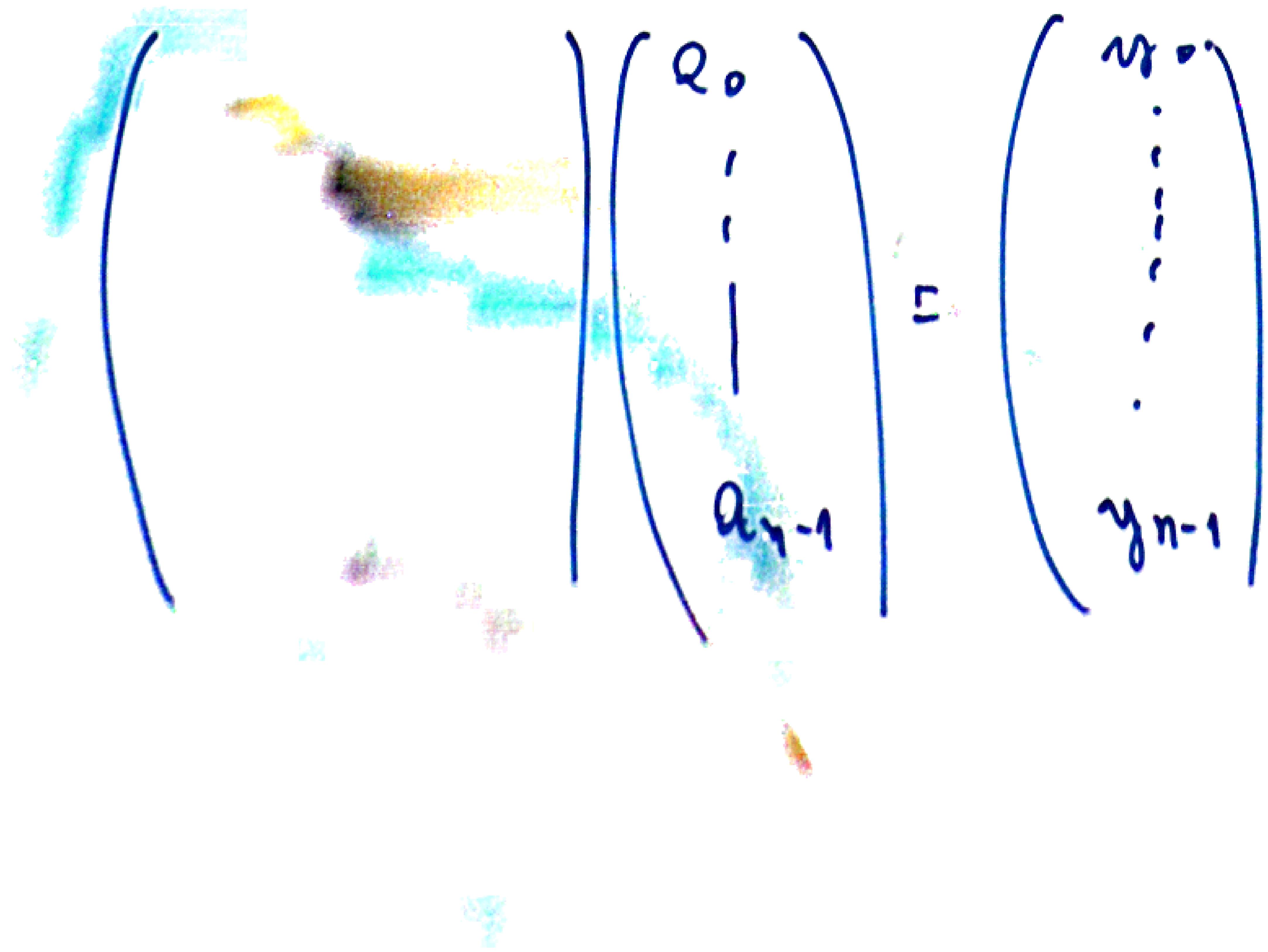


$p(x) \cdot g(x) \mapsto \{ (n_0, p(n_0) \cdot g(n_0)), \dots, \}$

$$\left(\begin{array}{c} q_0 \\ \vdots \\ a_{n-1} \end{array} \right) \in \left(\begin{array}{c} n_0 \\ \vdots \\ y_{n-1} \end{array} \right)$$

$p(x) \cdot q(x) \mapsto \{ (n_0, p(n_0) \cdot q(n_0)), \dots, \}$



$p(x) \cdot q(x) \mapsto \{ (w_0, p(w_0) \cdot q(w_0)), \dots, \}$

$$\begin{pmatrix} 1 & \dots & 1 \end{pmatrix} \begin{pmatrix} Q_0 \\ \vdots \\ Q_{n-1} \end{pmatrix} = \begin{pmatrix} w_0 \\ \vdots \\ w_{n-1} \end{pmatrix}$$

$$P(W_n) = \sum_{i=0}^{n-1} Q_i$$

$p(x) \cdot q(x) \mapsto \{ (w_0, p(w_0) \cdot q(w_0)), \dots, \}$

$$\begin{pmatrix} 1 & \dots & 1 \\ w_n & w_n^2 & \dots & w_n^{n-1} \end{pmatrix} \begin{pmatrix} Q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = \begin{pmatrix} w_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$P(w_n) = \sum_{i=0}^{n-1} a_i \cdot w_n^i$$

$p(x) \cdot q(x) \mapsto \{ (w_0, p(w_0) \cdot q(w_0)), \dots, \}$

$$\begin{pmatrix} 1 & \dots & 1 \\ w_n & w_n^2 & \dots & w_n^{n-1} \end{pmatrix} \begin{pmatrix} Q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = \begin{pmatrix} w_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$w_n^0, w_n^1, \dots, w_n^{n-1}$$
$$P(w_n) = \sum_{i=0}^{n-1} a_i \cdot w_n^i$$

$$f_n \begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \begin{pmatrix} w_0 \\ \vdots \\ w_{n-1} \end{pmatrix}$$

$$f_n \begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \begin{pmatrix} w_0 \\ \vdots \\ w_{n-1} \end{pmatrix}$$

$$F_n \cdot F_n = I_n$$

$$F_n \begin{pmatrix} Q_0 \\ \vdots \\ Q_{n-1} \end{pmatrix} = \begin{pmatrix} W_0 \\ \vdots \\ W_{n-1} \end{pmatrix}$$

$$F_n \cdot F_n = I_n$$

$$F_n \cdot F_n \cdot \begin{pmatrix} q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = F_n \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$\leftarrow \overline{y_0}, \overline{y_1}, \dots, \overline{y_n}$

$$F_n \cdot F_n = I_n$$

$$F_n \cdot F_n : \begin{pmatrix} q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = F_n \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$\leftarrow \overline{\gamma_n}$

$$F_n \cdot F_n = I_n$$

$$F_n \cdot F_n \cdot \begin{pmatrix} q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = F_n \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n \cdot F_n = I_n$$

$$F_n \cdot F_n \cdot \begin{pmatrix} q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = F_n \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$\leftarrow \text{右} \rightarrow$

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$F_n \cdot F_n \cdot \begin{pmatrix} q_0 \\ \vdots \\ a_{n-1} \end{pmatrix} = F_n \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

w_n^0, w_n^1, w_n^2

$\alpha \in \mathbb{R}_n$

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$F_n^*[i,j]$$

$$w_n^0, w_n^1, w_n^2$$

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$F_n^*[i,j] = \overline{F_n[j,i]}$$

$$w_n^0, w_n^1, w_n^2$$

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$\begin{aligned} F_n^*[i,j] &= \overline{F_n[j,i]} \\ &= \overline{w_n^{(j-1) \cdot (i-1)}} \end{aligned}$$

$$w_n^0, w_n^1, w_n^2$$

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$\begin{aligned} F_n^*[i,j] &= \overline{F_n[j,i]} \\ &= \overline{w_n^{(j-1) \cdot (i-1)}} \end{aligned}$$

$$\overline{w_n^k} = w_n^{-k}$$

$$F_n[i, j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$\begin{aligned} F_n^*[i, j] &= \overline{F_n[j, i]} \\ &= \overline{w_n^{(j-1) \cdot (i-1)}} \end{aligned}$$

$$\overline{\overline{w_n^k}} = w_n^{-k}$$

G,

$$F_n[i,j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$\begin{aligned} F_n^*[i,j] &= \overline{F_n[j,i]} \\ &= \overline{w_n^{(j-1) \cdot (i-1)}} \end{aligned}$$

$$\overline{w_n^k} = w_n^{-k}$$

$$w_n^k = e^{\frac{2\pi i}{n} \cdot k}$$

$$F_n[i, j] = (w_n^{i-1})^{j-1} = w_n^{(i-1) \cdot (j-1)}$$

$$F_n \cdot F_n = I_n$$

$$\begin{aligned} F_n^*[i, j] &= \overline{F_n[j, i]} \\ &= \overline{w_n^{(j-1) \cdot (i-1)}} \end{aligned}$$

$$\begin{aligned} \overline{w_n^k} &= \overline{w_n^{-k}} \\ w_n^k &= \frac{e^{\frac{2\pi i}{n} k}}{\overline{w_n^k}} \\ &= \cos\left(\frac{2\pi k}{n}\right) + i \sin\left(\frac{2\pi k}{n}\right) \cdot i \end{aligned}$$

$$= \cos\left(\frac{2\pi k}{n}\right) - i \sin\left(\frac{2\pi k}{n}\right) \cdot i$$

$$w_n^{-k} = \cos\left(-\frac{2\pi k}{n}\right) + i \sin\left(-\frac{2\pi k}{n}\right) \cdot i$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$F_n^* \cdot F_n = n \cdot I_n$$

$$F_n \cdot F_n = I_n$$

$$\overline{w_n^k} = \overline{w_n^{-k}}$$

$$\overline{w_n^k} = \frac{e^{\frac{2\pi i}{n} \cdot k}}{e}$$

$$= \cos\left(\frac{2\pi k}{n}\right) + i \sin\left(\frac{2\pi k}{n}\right) \cdot i$$

$$= \cos\left(\frac{2\pi k}{n}\right) - i \sin\left(\frac{2\pi k}{n}\right) \cdot i$$

$$w_n^{-k} = \cos\left(-\frac{2\pi k}{n}\right) + i \sin\left(-\frac{2\pi k}{n}\right) \cdot i$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

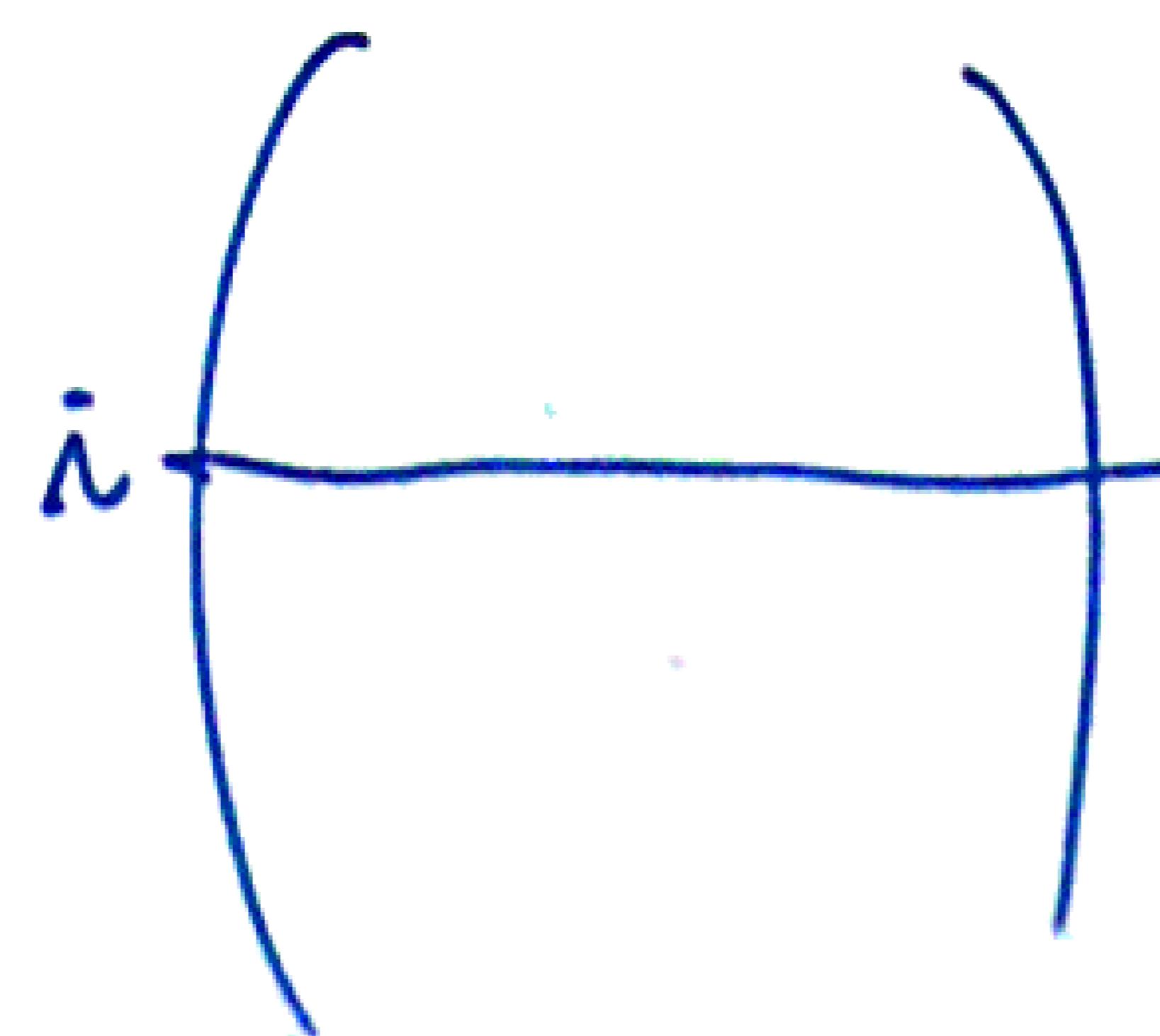
$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$F_n^* \cdot F_n = n \cdot I_n$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, i] = 0$$

$$F_n^*$$



$$F_n$$



$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)} \quad 1 \leq i, j \leq n \quad i \neq j$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)} \quad (F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^* \cdot F_n = n \cdot I_n$$

F_n^* F_n

 $= \sum_k$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)} \quad 1 \leq i, j \leq n \quad i \neq j$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)} \quad (F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^* \cdot F_n = n \cdot I_n$$

F_n^* F_n

 $= \sum_{k=1}^n$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)} \quad 1 \leq i, j \leq n \quad i \neq j$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)} \quad (F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^* \cdot F_n = n \cdot I_n$$

$$A = F_n^* \cdot F_n$$

$$F_n^*$$

$$F_n$$

$$= \sum_{k=1}^n F_n^*[i, k] \cdot F_n[k, j]$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n \left(w_n^{-(i-1)+j-1} \right)^{k-1} = \sum_{k=1}^n \left(w_n^{j-i} \right)^{k-1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, i] = 0$$

$$F_n^*$$

$$F_n$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1) \cdot (j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n \left(w_n^{-(i-1)+j-1} \right)^{k-1} = \sum_{k=1}^n \left(w_n^{j-i} \right)^{k-1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^*$$

$$F_n$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1) \cdot (j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n \left(w_n^{-(i-1)+j-1} \right)^{k-1} = \sum_{k=1}^n (x)^{k-1} = \frac{x^n - 1}{x - 1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^*$$

$$F_n$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1) \cdot (j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n \left(w_n^{-(i-1) + j-1} \right)^{k-1} = \sum_{k=1}^n \left(w_n^{j-i} \right)^{k-1} = \frac{x^n - 1}{x - 1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^*$$

$$F_n$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1) \cdot (j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n \left(w_n^{-(i-1) + j-1} \right)^{k-1} = \sum_{k=1}^n \left(w_n^{j-i} \right)^{k-1} = \frac{x^n - 1}{x - 1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^*$$

$$F_n$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1) \cdot (j-1)}$$

$$\sum_{k=1}^n w_n^{-(i-1) \cdot (k-1)} \cdot w_n^{(k-1) \cdot (j-1)}$$

$$= \sum_{k=1}^n (w_n^{-(i-1)+j-1})^{k-1} = \sum_{k=1}^n (w_n^{j-i})^{k-1} = \frac{x^n - 1}{x - 1}$$

$$1 \leq i, j \leq n \quad i \neq j$$

$$(F_n^* \cdot F_n)[i, j] = 0$$

$$F_n^*$$

$$F_n$$

J

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$n \cdot I_n \cdot \begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} F_n^* \cdot \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} F_n^* \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$F_n^* = F_n^T$$

$$\begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} (F_n^*) \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, 1] \\ \vdots \\ F_n^*[n, 1] \end{pmatrix}$$

$$\begin{pmatrix} F_n[1, 1] \\ \vdots \\ F_n[n, 1] \end{pmatrix}$$

$$\begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} \circled{F_n^*} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n^* = F_n.$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, 2] \\ \vdots \\ F_n^*[n, 1] \end{pmatrix} \xrightarrow{\text{?}}$$

$$\begin{pmatrix} F_n[1, 1] \\ \vdots \\ F_n[n, 1] \end{pmatrix} \xrightarrow{\text{?}}$$

$$\begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} (F_n^*) \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n^* = F_n.$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$F_n^* = F_n.$$

$$\begin{pmatrix} q_0 \\ \vdots \\ q_{n-1} \end{pmatrix} = \frac{1}{n} \circled{F_n^*} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

F_n

$$F_n^* = F_n^T$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

F_n

$$\begin{pmatrix} \ddots \\ \vdots \\ \ddots \end{pmatrix} \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

$$F_n^* = F_n.$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-(i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

F_n

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{matrix} 2 & 3 & 2 \\ 2 \cdot x^2 + 3x + 2 \end{matrix}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

F_n

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{matrix} 2 & 3 & 2 \\ 2 \cdot x^2 + 3x + 2 \end{matrix}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

F_n

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1)(j-1)}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array} \quad \left(\begin{array}{c} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{array} \right)$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array} \quad \left(\begin{array}{c} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{array} \right)$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} F_n & & & \\ & \ddots & & \\ & & \ddots & \\ & & & F_n \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{matrix} 2 & 3 & 2 \\ 2 \cdot x^2 + 3x + 2 \end{matrix}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

F_n

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1)(j-1)}$$

$$\begin{matrix} 2 & 3 & 2 \\ 2 \cdot x^2 + 3x + 2 \end{matrix}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

F_n

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{- (i-1)(j-1)}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix} \rightarrow$$

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$


$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix} \rightarrow$$

$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array} \quad \left(\begin{array}{c} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{array} \right)$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

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$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}.$$

$$\begin{pmatrix} & & & 1 & 0 & 0 & 0 \\ & & & 0 & 0 & 1 & \\ & & & 0 & 1 & 0 & \\ & & & 0 & 0 & 0 & \\ & & & 0 & 1 & 0 & \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

$$F_n[i, j] = w_n^{(i-1) \cdot (j-1)}$$

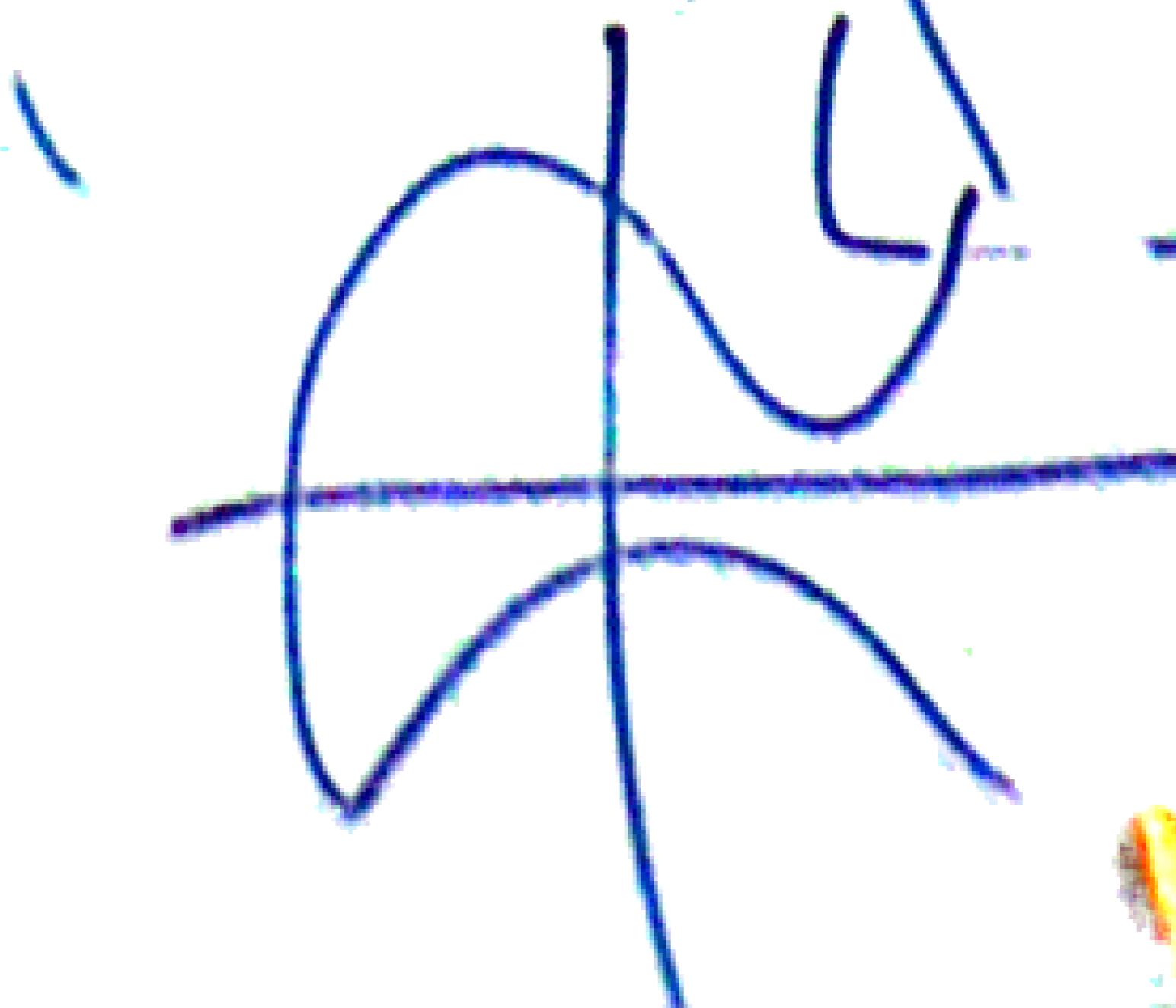
$$F_n^*[i, j] = w_n^{-((i-1)(j-1))}$$

$$\begin{pmatrix} F_n^*[1, j] \\ \vdots \\ F_n^*[n, j] \end{pmatrix} = \begin{pmatrix} F_n[1, n+2-j] \\ \vdots \\ F_n[n, n+2-j] \end{pmatrix}$$

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$$\begin{pmatrix} & & & \\ & & & \\ & & & \\ & & & \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$



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$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array}$$

$$\begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix} \rightarrow$$

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{pmatrix}$$

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$$\begin{pmatrix} & & & 1 & 0 & 0 & 0 \\ & & & 0 & 0 & 1 & 0 \\ & & & 0 & 1 & 0 & 0 \\ & & & 0 & 0 & 0 & 0 \end{pmatrix} \begin{pmatrix} y_0 \\ \vdots \\ y_{n-1} \end{pmatrix}$$

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$$\begin{array}{l} 232 \\ 2 \cdot x^2 + 3x + 2 \\ F_n \end{array} \quad \left(\begin{array}{c} y_0 \\ y_{n-1} \\ \vdots \\ y_1 \end{array} \right)$$

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