$$\frac{\partial \tilde{E}(w)}{\partial w_j} = \left\{ \sum_{n=1}^{N} \left(y(x_n, w) - t_n \right) \right\} x_n^j + \frac{\lambda}{2} \cdot \frac{\partial \|w\|^2}{\partial w_j}$$

$$\frac{\partial \|w\|^2}{\partial w_j} \rightarrow \lambda \cdot 2 w_j$$

$$= 0$$

$$x_n^j \sum_{n=1}^{N} \left(\sum_{i=0}^{M} w_i x_n^i - t_n \right) + \lambda 2 w_j = 0$$

$$\sum_{n=1}^{N} \left(\sum_{i=0}^{M} w_i x_n^{i+j} - t_n x^j \right) + \lambda 2 w_j = 0$$

$$\sum_{n=1}^{N} \left(\sum_{i=0}^{M} w_i x_n^{i+j} \right) + \lambda 2 w_j = \sum_{n=1}^{N} t_n x_n^j$$

$$\sum_{n=1}^{N} \left(\sum_{i=0}^{M} w_i x_n^{i+j} \right) \rightarrow \sum_{i=0}^{M} \left(\sum_{n=1}^{N} x_n^{i+j} \right) w_i \rightarrow A_{ij}$$

$$\sum_{n=1}^{N} t_n x_n^j \rightarrow T_j$$

$$\sum_{i=0}^{M} A_{ij} w_i + 2\lambda w_j = T_j$$