1 Answers to exercises chapter 1

1.2

The error function is given by

$$\tilde{E}(\mathbf{w}) = \frac{\mathbf{1}}{\mathbf{2}} \sum_{\mathbf{n=1}}^{\mathbf{N}} \{\mathbf{y}(\mathbf{x_n}, \mathbf{w}) - \mathbf{t_n}\}^{\mathbf{2}} + \frac{\mathbf{1}}{\mathbf{2}} \|\mathbf{w}\|^{\mathbf{2}}. \tag{1}$$

$$\frac{\partial \tilde{E}(\mathbf{w})}{\partial w_l} = \sum_{n=1}^{N} \left\{ w_j x_n^j - t_n \right\} \delta_{lk} x^k + w_l \tag{2}$$

$$= = \sum_{n=1}^{N} \left\{ \sum_{j=0}^{M} w_j x^j x_n^l \right\} - \sum_{n=1}^{N} t_n x^l + w_l \tag{3}$$