

Solution exercise 3:

$$f(x) = \sum_{j=1}^m \sigma(Wx)v_j$$

$$\sum_{i=1}^n (f(x^{(i)}) - y^{(i)})^2 = E$$

$$\frac{\partial E}{\partial v_k} = 2(f(x) - y)\sigma(w_k^T x)$$

For $w_j = 0 \implies \frac{\partial E}{\partial v_k} = 0$ since $\sigma(0) = \tanh(0) = 0$

$$\frac{\partial E}{\partial w_k} = 2(f(x) - y)v_k\sigma'(w_k^T x)x = 0$$

since $v_k = 0$.