Problem 2.27

This Problem is solved like problem 1.10.

Problem 3.3

The solution of w_{ML} is metioned in the equation (3.12) and (3.1) if we subtitute $\beta^{-1} = r_n\beta^{-1}$. The derivative of the equation (3.104) by w:

$$\begin{aligned}\frac{\partial}{\partial w}E_D(w) &= \frac{\partial}{\partial w}\sum_{n=1}^{N} r_n(t_n + w^T\phi(x_n)) \\ &= \sum_{n=1}^{N} r_n(t_n + w^T\phi(x_n))\phi(x_n)\end{aligned}$$

Set the derivative of the equation equal zero and based on the equation (3.16), we obtain:

$$w_M L = r_n(\Phi^T\Phi)^{-1}\Phi^T t$$