5.24 Let's apply the transformations in 5.115, 5.116 and 5.117 to the network function defined by 5.113:

$$\tilde{z}_j = h\left(\sum_i \tilde{w}_{ji}\tilde{x}_i + \tilde{w}_{j0}\right)$$

$$= h\left(\sum_i \frac{1}{a} w_{ji}(ax_i + b) + w_{j0} - \frac{b}{a}\sum_i w_{ji}\right)$$

$$= h\left(\sum_i w_{ji}\left(x_i + \frac{b}{a}\right) + w_{j0} - \frac{b}{a}\sum_i w_{ji}\right)$$

$$= h\left(\sum_i w_{ji}x_i + w_{j0} + \sum_i w_{ji}\frac{b}{a} - \frac{b}{a}\sum_i w_{ji}\right)$$

$$= h\left(\sum_i w_{ji}x_i + w_{j0}\right)$$

$$= z_j$$

Now, let's apply the transformations in 5.118, 5.119 and 5.120 to the network function defined by 5.114:

$$\sum_j \tilde{w}_{kj}z_j + \tilde{w}_{k0}$$

$$= \sum_j cw_{kj}z_j + cw_{k0} + d$$

$$= \sum_j c(w_{kj}z_j + w_{k0}) + d$$

$$= \sum_j cy_k + d$$

$$= \tilde{y}_k$$