1. Mean squared error

$$\frac{\partial J}{\partial W_{jk}} = \frac{\partial J}{\partial y_k}\frac{\partial y_k}{\partial in_k}\frac{\partial in_j}{\partial W_{jk}}$$

where

$$in_k = \sum_j W_{jk}x_j + b_k$$

and y_k is the sigmoid function of in_j

$$\frac{\partial J}{\partial y_k} = -(t_k - y_k)$$

$$\frac{\partial y_k}{\partial in_j} = y_k(1 - y_k)$$

$$\frac{\partial in_j}{\partial W_{jk}} = \frac{\partial}{\partial W_{jk}}\sum_j W_{jk}x_j + b_k = x_j$$

$$\frac{\partial J}{\partial W_{jk}} = -(t_k - y_k)y_k(1 - y_k)x_j$$

This partial derivitive for the bias works the same way, except

$$\frac{\partial J}{\partial y_k} = -(t_k - y_k)$$

$$\frac{\partial y_k}{\partial in_j} = y_k(1 - y_k)$$

$$\frac{\partial in_j}{\partial b_k} = 1$$

$$\frac{\partial J}{\partial b_k} = -(t_k - y_k)y_k(1 - y_k)$$

Thus, the update for the weights and baises become:

$$W_{jk} \leftarrow W_{jk} - \eta\frac{\partial J}{\partial W_{jk}}$$

$$b_k \leftarrow b_k - \eta\frac{\partial J}{\partial b_k}$$

2. Cross-entropy error
The only term that changes here is $\frac{\partial J}{\partial y_k}$ which becomes:

$$\frac{1 - t_k}{1 - y_k} - \frac{t_k}{y_k}$$

so the entire gradient becomes

$$\frac{\partial J}{\partial y_k} = (\frac{1-t_k}{1-y_k} - \frac{t_k}{y_k})y_k(1-y_k)x_j$$