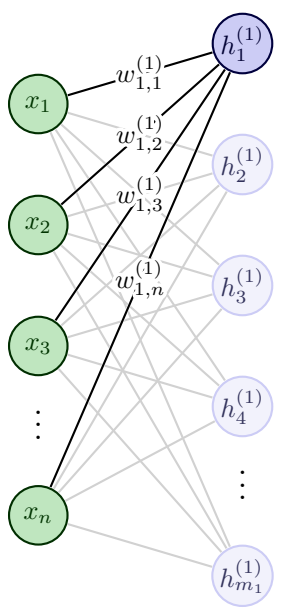

$$= \Phi_1 \left(w_{1,1}^{(1)} \cdot x_1 + w_{1,2}^{(1)} \cdot x_2 + \ldots + w_{1,n}^{(1)} \cdot x_n + b_1^{(1)} \right)$$

$$= \Phi_1 \left(\sum_{i=1}^{n} w_{1,i}^{(1)} \cdot x_i + b_1^{(1)} \right) = \Phi_1 \left(z_1^{(1)} \right)$$

$$\begin{bmatrix} h_1^{(1)} \\ h_2^{(1)} \\ \vdots \\ h_{m_1}^{(1)} \end{bmatrix} = \Phi_1 \left(\begin{bmatrix} w_{1,1}^{(1)} & w_{1,2}^{(1)} & \ldots & w_{1,n}^{(1)} \\ w_{2,1}^{(1)} & w_{2,2}^{(1)} & \ldots & w_{2,n}^{(1)} \\ \vdots & \vdots & \ddots & \vdots \\ w_{m_1,1}^{(1)} & w_{m_1,2}^{(1)} & \ldots & w_{m_1,n}^{(1)} \end{bmatrix} \cdot \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} + \begin{bmatrix} b_1^{(1)} \\ b_2^{(1)} \\ \vdots \\ b_{m_1}^{(1)} \end{bmatrix} \right) = \Phi_1 \left(\begin{bmatrix} z_1^{(1)} \\ z_2^{(1)} \\ \vdots \\ z_{m_1}^{(1)} \end{bmatrix} \right)$$

$$\boldsymbol{h}^{(1)} = \Phi_1 \left(\boldsymbol{W}^{(1)} \cdot \boldsymbol{x} + \boldsymbol{b}^{(1)} \right) = \Phi_1 \left(\boldsymbol{z}^{(1)} \right)$$