



$$\begin{aligned} a_1 &= \sigma \left( \left( \sum_{i=1}^4 x_i w_{1i} \right) + b_1 \right) \\ &= \sigma \left( \begin{bmatrix} w_{11} & w_{12} & w_{13} & w_{14} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} + b_1 \right) \end{aligned}$$