$$eq\ 22 \Rightarrow a' = \sigma(wa+b)$$

$$\underline{\underline{eq\ 4}} \Rightarrow a' = \frac{1}{1+e^{(-\sum_j w_j x_j - b)}}$$

$$a' = \sigma(wa+b)$$

$a \to$ activation vector

$$a = \begin{bmatrix} a_1 \\ a_2 \\ \vdots \\ a_n \end{bmatrix}$$

$w \Rightarrow$ weight vectorized

$$w = [w_1, w_2, \ldots w_n]$$

$$wa = [w_1, w_2, \ldots, w_n] \begin{bmatrix} a_1 \\ a_2 \\ \vdots \\ a_n \end{bmatrix}$$

$$= w_1 a_1 + w_2 a_2 + \ldots + w_n a_n$$

$$w.a = \sum_i w_i a_i = \sum_j w_j a_j$$

$$\sigma(wa+b) = \sigma\left(\sum_j w_j a_j + b\right)$$

$$= \frac{1}{1+e^{-(\sum_j w_j a_j + b)}} = eq\ 4$$

Hence proved.