⟨More Complex Neural Network⟩

$\vec{x}$ → input

input layer

layer 0
$\vec{x} = a^{[0]}$

layer 1   layer 2   layer 3   layer 4

output layer

hidden layer

* layer 3

$\vec{a}^{[2]}$

vectors of activation values from layer 2

$\vec{w}_1^{[3]}, b_1^{[3]}$ → $a_1^{[3]} = g\left(\vec{w}_1^{[3]} \cdot \vec{a}^{[2]} + b_1^{[3]}\right)$

$\vec{w}_2^{[3]}, b_2^{[3]}$ → $a_2^{[3]} = g\left(\vec{w}_2^{[3]} \cdot \vec{a}^{[2]} + b_2^{[3]}\right)$

$\vec{w}_3^{[3]}, b_3^{[3]}$ → $a_3^{[3]} = g\left(\vec{w}_3^{[3]} \cdot \vec{a}^{[2]} + b_3^{[3]}\right)$

→ $\vec{a}^{[3]}$
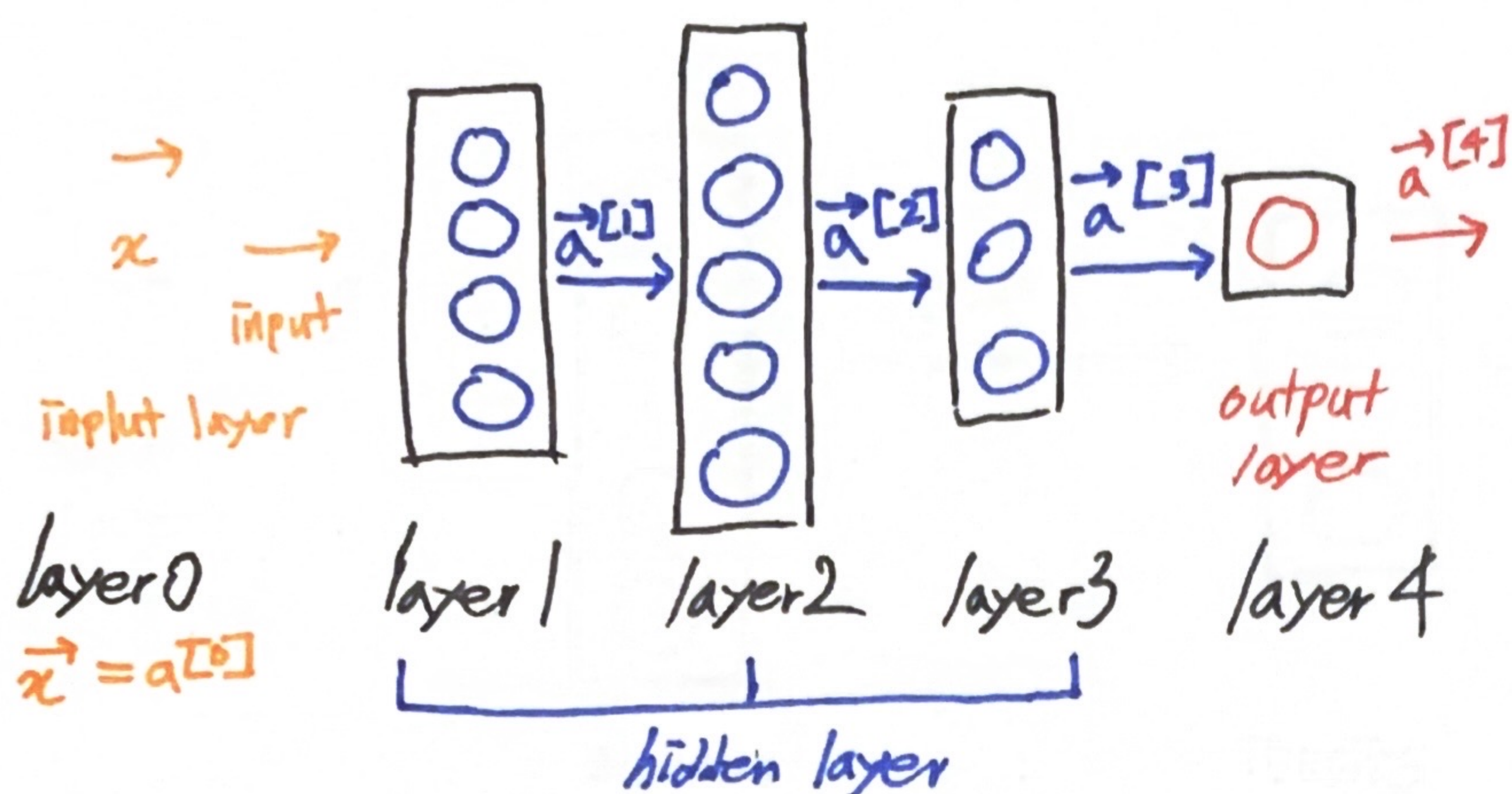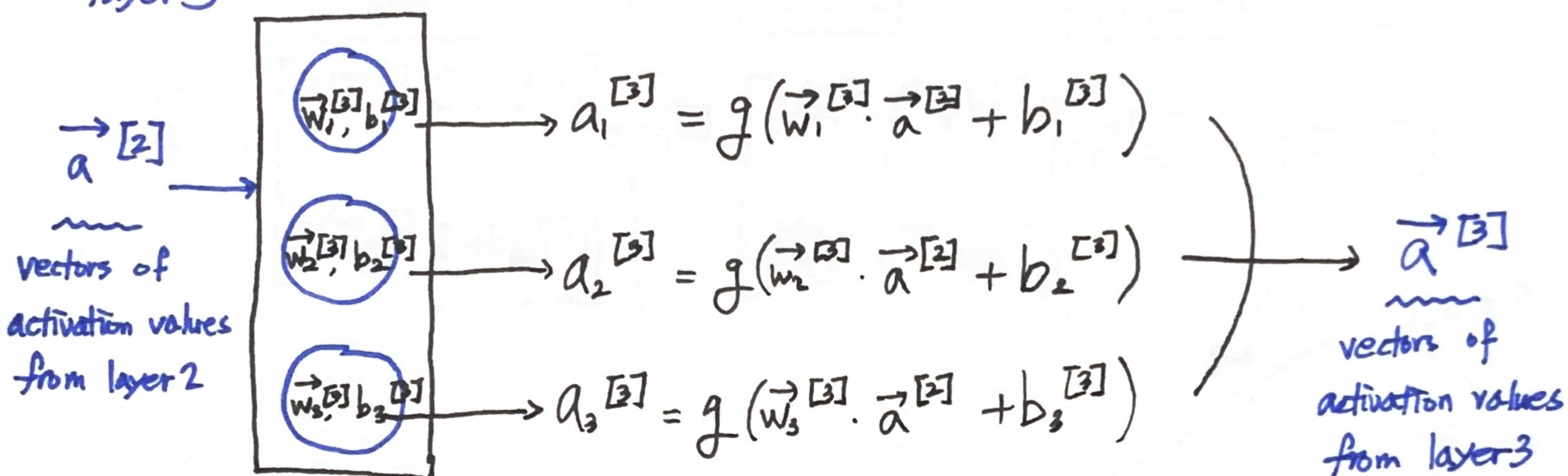
vectors of activation values from layer 3

* general form

$$a_j^{[l]} = g\left(\vec{w}_j^{[l]} \cdot \vec{a}^{[l-1]} + b_j^{[l]}\right)$$

l : arbitrary layer
j : arbitrary unit

activation value of layer l, unit (neuron) j

sigmoid "activation function"

$l-1$: output layer $l-1$ (previous layer)

parameters w, b of layer l, unit j