Step function:

$$\text{step}(z) = \begin{cases} 0 & \text{if } z < 0 \\ 1 & \text{otherwise} \end{cases}$$

Rectified linear unit (ReLU):

$$\text{ReLU}(z) = \begin{cases} 0 & \text{if } z < 0 \\ z & \text{otherwise} \end{cases} = \max(0, z)$$

Sigmoid function: Also known as a *logistic* function, can be interpreted as probability, because for any value of z the output is in $(0, 1)$

$$\sigma(z) = \frac{1}{1 + e^{-z}}$$

Hyperbolic tangent: Always in the range $(-1, 1)$

$$\tanh(z) = \frac{e^{z} - e^{-z}}{e^{z} + e^{-z}}$$

Softmax function: Takes a whole vector $Z \in \mathbb{R}^n$ and generates as output a vector $A \in (0, 1)^n$ with the property that $\sum_{i=1}^{n} A_i = 1$, which means we can interpret it as a probability distribution over n items:

$$\text{softmax}(z) = \begin{bmatrix} \exp(z_1) / \sum_i \exp(z_i) \\ \vdots \\ \exp(z_n) / \sum_i \exp(z_i) \end{bmatrix}$$