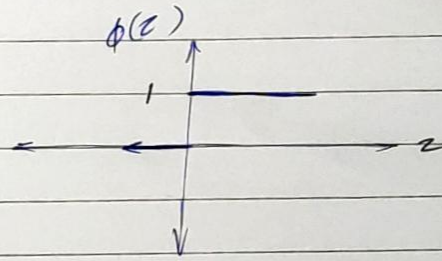# 1. Activation Function
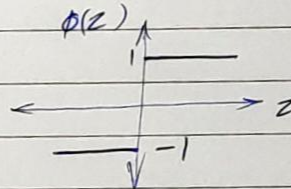
1. Unit step function
$$\phi(z) = \begin{cases} 0 & z < 0 \\ 0.5 & z = 0 \\ 1 & z > 0 \end{cases}$$
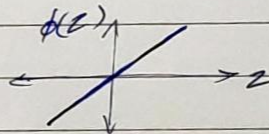
2. sign (signum) function
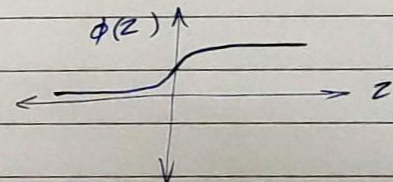$$\phi(z) = \begin{cases} -1 & z < 0 \\ 0 & z = 0 \\ 1 & z > 0 \end{cases}$$

3. Linear function
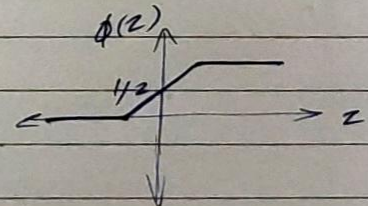$$\phi(z) = z$$

4. Logistic function (sigmoid)
$$\phi(z) = \frac{1}{1 + e^{-av}}$$
$a = $ slope of sigmoidal function.

5. piecewise linear function
$$\phi(z) = \begin{cases} 1 & z \geq 1/2 \\ z + 1/2 & -1/2 \leq z < 1/2 \\ 0 & z \leq -1/2 \end{cases}$$

6. Hyperbolic tangent
$$\phi(z) = \frac{e^z - e^{-z}}{e^z + e^{-z}}$$