Q2. (i) $\mathcal{H}$ consists of all hypothesis $h : R \longrightarrow \{-1, +1\}$ of form $h(x) = \text{sign}(x - a)$.

The breaking point for $\mathcal{H}$ is $k = 2$ because $(1, -1) \notin \mathcal{H}(x_1, x_2)$

(ii) $\mathcal{H}$ consists of all hypothesis in one dimension that return +1 within some interval and -1 otherwise.

The breaking point for $\mathcal{H}$ is $k = 3$ because $(1, -1, 1) \notin \mathcal{H}(x_1, x_2, x_3)$.

Q3 The VC dimension of $\mathcal{H}$ for hypothesis sets in

PART	VC dim (d_{vc})
(i)	1
(ii)	2
(iii)	∞

For (i), $k = d_{vc} + 1$

$\therefore 2 = d_{vc} + 1$

$\therefore d_{vc} = 1$

For (ii), $k = d_{vc} + 1$

$\therefore 3 = d_{vc} + 1$

$\therefore d_{vc} = 2$

For (iii), $m_{\mathcal{H}}(N) = 2^N \quad \forall N.$