Q5.

$$V_*(s) = \max_{\pi} V_\pi(s)$$

$$= \max_{\pi} \mathbb{E}_\pi[G_t | S_t = s]$$

$$= \max_{a, \pi} \mathbb{E}_\pi[G_t | S_t = s, A_t = a] \, p(a|s)$$

$$= \max_{a, \pi} q_\pi(a|s) \cdot p(a|s)$$

$$= \max_{a} q_*(a,s) \, p(\cancel{a|s}) \, p(a|s) .$$

$$\boxed{V_*(s) \ne = \max_{a} q_*(a,s)}$$
.

dependency of
$V_*(s)$ on action
that max $q_*(s,c)$