

This handout includes space for every question that requires a written response. Please feel free to use it to handwrite your solutions (legibly, please). If you choose to typeset your solutions, the | README.md | for this assignment includes instructions to regenerate this handout with your typeset  $\text{\LaTeX}$  solutions.

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1.a

1.b

1.c

$$\begin{aligned} V^\pi(s_0) - V^{\pi'}(s_0) &= \mathbb{E}_{\tau \sim \rho^\pi} \left[ \sum_{t=0}^{\infty} \gamma^t \mathcal{R}(s_t, a_t) \right] - V^{\pi'}(s_0) \\ &= \mathbb{E}_{\tau \sim \rho^\pi} \left[ \sum_{t=0}^{\infty} \gamma^t \left( \mathcal{R}(s_t, a_t) + V^{\pi'}(s_t) - V^{\pi'}(s_t) \right) \right] - V^{\pi'}(s_0) \\ &= \mathbb{E}_{\tau \sim \rho^\pi} \left[ \sum_{t=0}^{\infty} \gamma^t \left( \mathcal{R}(s_t, a_t) + \gamma V^{\pi'}(s_{t+1}) - V^{\pi'}(s_t) \right) \right] \end{aligned}$$

2.a

3.b

5.a