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(a)

$$L(x, \lambda, v) = c^T x - \lambda^T x + v^T (Ax - b)$$

$$(b) \nabla_x L = c - \lambda + A^T v = 0$$

$$\begin{aligned} g(\lambda, v) &= \inf_x L(x, \lambda, v) \\ &= \begin{cases} -v^T b, & c - \lambda + A^T v = 0 \\ -\infty, & \text{otherwise} \end{cases} \end{aligned}$$

$$\text{dom } g = \{(\lambda, v) \mid c - \lambda + A^T v = 0\}$$

(c)

$$\begin{aligned} &\text{maximize} \quad -v^T b \\ &\text{subject to} \quad c - \lambda + A^T v = 0 \\ &\quad \quad \quad \lambda \geq 0 \end{aligned}$$

or

$$\begin{aligned} &\text{maximize} \quad -v^T b \\ &\text{subject to} \quad c + A^T v \geq 0 \end{aligned}$$