

[12] 2. Consider this LP:

$$\begin{array}{ll}\max & 7x_1 + 5x_2 + 2x_3 \\ \text{subject to} & x_1 + x_2 \leq 5 \\ & -x_1 + 2x_2 + x_3 \leq 4 \\ & x_1 - x_3 \leq 2 \\ & x_1, x_2, x_3 \geq 0\end{array}$$

- (a) Use the entries 0, 5, and 9, in some order, to invent a feasible input $\mathbf{x}^* = (x_1^*, x_2^*, x_3^*)$.
[2 marks]
- (b) Find the dual linear program.
[2 marks]
- (c) Find all solutions of the dual LP. Explain how you know there are no others.
(*Clue*: Part (a) may help.)
[6 marks]
- (d) Find all solutions of the given (primal) LP. Explain how you know there are no others.
[2 marks]