[8] **5.** The following dictionary has been produced by solving a certain linear program in standard form:

$$\begin{aligned} x_1 &= 1 + x_2 - 2x_4 + x_6 \\ x_3 &= 3 - 4x_2 + 3x_4 - 2x_6 \\ x_5 &= 2 + 3x_2 + 2x_4 \\ \hline z &= 15 - x_2 - 3x_4 \end{aligned}$$

(a) Find the original problem. [6 marks]

(b) The client that brought you this problem wants to see a maximum value of 17. Suppose you can change the number on the right side of exactly one of the constraints in the original problem. Which constraint will you choose to modify, and by how much, in your first attempt to satisfy the client? Explain. (A well-informed first approximation will suffice.) [2 marks]

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