Worksheet - Lecture 8

Characterizing Solution Sets

1. For each of the following systems, determine whether they have a unique solution, no solution, or infinitely many solutions. If a system has a unique solution, provide that solution. If a system has infinitely many solutions, characterize the solution set as was done in the lecture.

a. $\begin{cases} x + 2y + z = 2 \\ 2x + 4y \quad\;\; = 2 \\ 3x + 6y + z = 4 \end{cases}$

b. $\begin{cases} 2x_1 + 2x_2 + 6x_3 = 4 \\ 2x_1 + \;\; x_2 + 7x_3 = 6 \\ -2x_1 - 6x_2 - 7x_3 = -1 \end{cases}$

c. $\begin{cases} -h + l + w = 1 \\ -h - l + w = 2 \\ \;\; h - l + w = 3 \\ \;\; h + l + w = 4 \end{cases}$

d. $\begin{cases} -h + l + w = 1 \\ -h - l + w = 2 \\ \;\; h - l + w = 3 \\ \;\; h + l + w = 2 \end{cases}$

c. $\begin{cases} \;\; x_1 + 2x_2 + 2x_3 + 3x_4 = 0 \\ 2x_1 + 4x_2 + \;\; x_3 + 3x_4 = 0 \\ 3x_1 + 6x_2 + \;\; x_3 + 4x_4 = 0 \end{cases}$