

Question 1. (*3 marks*) If a system of equations has more equations than variables, can it have a solution? If so, give an example and if not, explain why.

Question 2. (*4 marks*) Choose h and k such that the augmented matrix shown has each of the following: one solution, no solution and infinitely many solutions. Justify your answer! $\begin{bmatrix} 1 & 2 & 2 \\ 2 & h & k \end{bmatrix}$

Question 3. (*3 marks*) Given the linear system

$$\begin{cases} x - y + z = b_1 \\ 2x - 2y - 2z = b_2 \\ x + 3y - 5z = b_3 \end{cases}.$$

Determine the b_i if the linear system has the particular solution $(3, -2, 1)$.