Problem 1. Use the Gaussian elimination method to solve the system

(a) \[\begin{align*}
3x - 6y + 9z &= 0 \\
4x - 6y + 8z &= -4 \\
-2x - y + z &= 7 \\
\end{align*}\]

(b) \[\begin{align*}
y + z &= 0 \\
3x - y + z &= -6 \\
6x - z &= 3 \\
\end{align*}\]

(c) \[\begin{align*}
2x + 2y + 4z &= 8 \\
x - y + 2z &= 2 \\
x - 5y - 2z &= 2 \\
\end{align*}\]

(d) \[\begin{align*}
x_1 - x_2 + x_3 &= 3 \\
x_1 + x_2 - x_3 &= 5 \\
-2x_1 + 4x_2 - 4x_3 &= 1 \\
\end{align*}\]

Problem 2. Find the solution of the system of linear equations represented by the augmented matrix:

(a) \[\begin{bmatrix}
2 & 2 & 2 & 4 & -12 \\
0 & 1 & 1 & 1 & -5 \\
0 & 0 & 1 & 2 & -6 \\
1 & 1 & 1 & 4 & -14 \\
\end{bmatrix}\]

(b) \[\begin{bmatrix}
2 & 0 & -1 & 5 & 19 \\
2 & 3 & -1 & 5 & 28 \\
0 & 0 & -1 & 5 & 21 \\
6 & 0 & -3 & 0 & -3 \\
\end{bmatrix}\]

Problem 3. (*) Find, if possible, example of each of the following types of systems of linear equations:

(a) A system of 3 equations in 2 unknowns which is consistent.
(b) A system of 2 equations in 3 unknowns which is inconsistent.
(c) A system of 2 equations in 3 unknowns which has a unique solution.