Activity 1.2.2 Gaussian Elimination. For each of the following linear systems, use Gaussian elimination to describe the solutions to the following systems of linear equations. In particular, determine whether each linear system has exactly one solution, infinitely many solutions, or no solutions.

a.
$$\begin{aligned} x + y + 2z &= 1 \\ 2x - y - 2z &= 2 \\ -x + y + z &= 0 \end{aligned}$$

b.
$$\begin{aligned} -x - 2y + 2z &= -1 \\ 2x + 4y - z &= 5 \\ x + 2y &= 3 \end{aligned}$$

c.
$$\begin{aligned} -x - 2y + 2z &= -1 \\ 2x + 4y - z &= 5 \\ x + 2y &= 2 \end{aligned}$$