Homework #2

Section 10.1 Solution of Linear Systems

28. $x - z = -3$
$y + z = 9$
$-x + z = 3$

The augmented matrix is

$$\left[\begin{array}{ccc|c} 1 & 0 & -1 & -3 \\ 0 & 1 & 1 & 9 \\ -1 & 0 & 1 & 3 \end{array}\right].$$

$$\begin{matrix} \\ \\ R_1 + R_3 \to R_3 \end{matrix} \quad \left[\begin{array}{ccc|c} 1 & 0 & -1 & -3 \\ 0 & 1 & 1 & 9 \\ 0 & 0 & 0 & 0 \end{array}\right]$$

The last row indicates that there are an infinite number of solutions. The remaining equations are

$$\begin{aligned} x - z &= -3 \\ y + z &= 9. \end{aligned}$$

Solve these for x and y to obtain

$$\begin{aligned} x &= z - 3 \\ y &= -z + 9. \end{aligned}$$

There are an infinite number of solutions, each of the form

$$(z - 3, -z + 9, z),$$

for any real number z.