WORKSHEET 0 SOLUTIONS NAME:

This Worksheet will **not** be collected. We will discuss these problems during Friday's lecture.

1.1. Introduction to Systems of Linear Equations

1. Find all solutions to the following system of linear equations. That is, find all values of x, y, z that satisfies all of the equations below:

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

Answer. This system has $\boxed{\text{one solution}}$ given by $x = 2, y = 0$, and $z = 1$.

2. Do the same for the following system:

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

Answer. This system has $\boxed{\text{no solutions}}$.

3. Do the same for one more system:

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

Answer. This system has $\boxed{\text{infinitely many solutions}}$. If we let y be any real number, then we have solution x, y, z with $x = 2 + y$ and $z = 1$.