Matrix Solutions to Linear Systems

1. Write the augmented matrix for each system of linear equations (similar to p.564 #2)

$$9x-3y+4z=15$$
$$x+2y-z=-23$$
$$-3x-y+z=18$$

2. Write the augmented matrix for each system of linear equations (similar to p.564 #6)

$$x-4y+2z=3$$
$$5x+y=7$$
$$9x-3z=1$$

3. Write the system of linear equations represented by the augmented matrix. Use x, y, and z, or, if necessary, w, x, y, and z for the variables (similar to p.564 #10)

$$\left[\begin{array}{ccc|c} 2 & 0 & 3 & 7 \\ 0 & 2 & -4 & 5 \\ 3 & 4 & 0 & -1 \end{array}\right]$$

4. Do the indicated row operation (similar to p.565 #14)

$$\left[\begin{array}{ccc|c} 5 & -20 & -10 & 2 \\ 7 & -1 & -3 & 4 \\ 2 & 8 & 2 & -2 \end{array}\right], \quad \frac{1}{5}R_1$$

5. Do the indicated row operation (similar to p.565 #16)

$$\left[\begin{array}{ccc|c} 4 & -2 & 3 & 1 \\ 5 & -1 & -2 & 9 \\ 1 & 2 & 7 & -3 \end{array}\right], \quad -2R_1+R_2$$

6. Solve each system of equations using matrices. Use Gaussian elimination with back-substitution or Gauss-Jordan elimination (similar to p.565 #26)

$$\begin{aligned} x \qquad & -5z = -4 \\ 3x + 4y & - 2z = 9 \\ 2x - 4y & + 3z = -3 \end{aligned}$$

7. Solve each system of equations using matrices. Use Gaussian elimination with back-substitution or Gauss-Jordan elimination (similar to p.565 #36)

$$\begin{aligned} w + x - 2y + 3z &= 16 \\ 3w - x - y + 5z &= 18 \\ w + 2x - 3y - 4z &= -9 \\ w - 5x - y - 2z &= -12 \end{aligned}$$