1. (1 point) Solve the system

$$\begin{cases} x_1 - x_2 + 5x_3 = -3 \\ 5x_1 - 6x_2 + 4x_3 = -7 \\ -2x_1 - 52x_3 = 22 \end{cases}$$

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \end{bmatrix} + s \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \end{bmatrix}.$$

Answer(s) submitted:

•

(incorrect)

2. (1 point) Solve the system

$$\begin{cases} x_1 + x_2 - 2x_3 = -7 \\ 5x_1 + 6x_2 + 5x_3 = -1 \end{cases}$$

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \end{bmatrix} + s \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \end{bmatrix}.$$

Answer(s) submitted:

• •

(incorrect)

3. (1 point) Reduce the matrix

$$A = \begin{bmatrix} -2 & -1 & -3 \\ 1 & 3 & -6 \end{bmatrix}$$

to reduced row-echelon form.

$$\begin{bmatrix} \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \end{bmatrix}$$

Answer(s) submitted:

•

(incorrect)

4. (1 point) Reduce the matrix

$$A = \begin{bmatrix} -1 & -2 & 4 & 1 \\ -1 & 2 & -2 & -1 \\ -2 & 1 & -2 & -8 \end{bmatrix}$$

to reduced row-echelon form.

$$\begin{bmatrix} \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \end{bmatrix}$$

Answer(s) submitted:

•

(incorrect)

5. (1 point) Solve the system

$$\begin{cases} x + y = 4 \\ 4x - 2y = 52 \\ 14x - 4y = 164 \end{cases}$$

If there is no solution, enter *NONE* in both answer blanks.

$x =$ _____

$y =$ _____

Answer(s) submitted:

•

•

(incorrect)

6. (1 point) How many free variables does each augmented matrix have?

(1) [Choose/None/One/Two/Three] $\left[\begin{array}{cccc|c} 1 & 0 & 0 & 10 & 10 \\ 0 & 1 & 0 & 0 & -2 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{array}\right]$

(2) [Choose/None/One/Two/Three] $\left[\begin{array}{cc|c} 1 & 0 & -6 \\ 0 & 1 & 9 \\ 0 & 0 & 0 \end{array}\right]$

(3) [Choose/None/One/Two/Three] $\left[\begin{array}{ccc|c} 1 & -3 & -9 & 8 \\ 0 & 0 & 0 & 0 \end{array}\right]$

(4) [Choose/None/One/Two/Three] $\left[\begin{array}{cc|c} 1 & -7 & -9 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}\right]$

Answer(s) submitted:

•

•

•

•

(incorrect)

7. (1 point) Solve the system

$$\begin{cases} x_1 + x_2 = -1 \\ x_2 + x_3 = -1 \\ x_3 + x_4 = -4 \\ x_1 + x_4 = -4 \end{cases}$$

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \\ \_\_ \end{bmatrix} + s \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \\ \_\_ \end{bmatrix}.$$

Answer(s) submitted:

•

(incorrect)

8. (1 point) Determine the value of k for which the system

$$\begin{cases} x + y + 5z = -2 \\ x + 2y - 3z = -1 \\ 7x + 16y + kz = -4 \end{cases}$$

has no solutions.

$k =$ _____

Answer(s) submitted:

•

(incorrect)

9. (1 point) Find the missing coordinates such that the three vectors form an orthonormal basis for $\mathbb{R}^3$:

$$\begin{bmatrix} -0.6 \\ -0.8 \\ \_\_ \end{bmatrix}, \begin{bmatrix} \_\_ \\ \_\_ \\ -1 \end{bmatrix}, \begin{bmatrix} \_\_ \\ 0.6 \\ \_\_ \end{bmatrix}.$$

Answer(s) submitted:

•

•

•

•

(incorrect)

10. (1 point) Let

$$\mathbf{v}_1 = \begin{bmatrix} 0.5 \\ 0.5 \\ 0.5 \\ 0.5 \end{bmatrix}, \mathbf{v}_2 = \begin{bmatrix} 0.5 \\ -0.5 \\ 0.5 \\ -0.5 \end{bmatrix}, \mathbf{v}_3 = \begin{bmatrix} 0.5 \\ 0.5 \\ -0.5 \\ -0.5 \end{bmatrix}.$$

The vectors $\mathbf{v}_1$, $\mathbf{v}_2$ and $\mathbf{v}_3$ form an orthonormal list in $\mathbb{R}^4$. Find a vector $\mathbf{v}_4$ such that $\mathbf{v}_1$, $\mathbf{v}_2$, $\mathbf{v}_3$, and $\mathbf{v}_4$ form an orthonormal basis of $\mathbb{R}^4$.

$$\mathbf{v}_4 = \begin{bmatrix} \_\_ \\ \_\_ \\ \_\_ \\ \_\_ \end{bmatrix}$$

Answer(s) submitted:

•

(incorrect)