

4.2 Answer Key

Practice 4.2-1-1:

Write the following systems as augmented matrices and identify the size of the matrix.

$$\begin{cases} -y + z = 2 \\ x + 4y + 2z = 0 \\ 5x - 2y + z = -5 \end{cases}$$

$$\begin{bmatrix} 0 & -1 & 1 & 2 \\ 1 & 4 & 2 & 0 \\ 5 & -2 & 1 & -5 \end{bmatrix}$$

This format is the format you will see in the calculator, such as TI-84. It has 3 rows and 4 columns; thus, the size is 3x4.

Mathematically, if we have a function and its equation, we use a vertical line to represent the equal sign.

Answer:

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

Vertical line represents equal

Practice 4.2-2-1:

Write system of linear equations from the augmented matrix.

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

The number after the vertical line (on the right) is the value of the equation. Therefore, we only assume the variables x and y.

Step 1:

Column 1 → x

Column 2 → y

Column 3 → z

Step 2:

$$\begin{cases} 0x + y + 5z = 1 \\ 0x + y + 7z = 0 \\ -3x + 2y + z = 2 \end{cases}$$

Answer:
$$\begin{cases} y + 5z = 1 \\ y + 7z = 0 \\ -3x + 2y + z = 2 \end{cases}$$

Practice 4.2-3-1:

Use the matrix perform the indicated row operation $R_2 \leftrightarrow R_3$.

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

Labeling the matrix row:

$$\begin{array}{l} R_1 \\ R_2 \\ R_3 \end{array} \left[\begin{array}{ccc|c} 1 & 2 & 5 & 0 \\ 3 & -1 & 0 & 3 \\ 2 & 4 & 1 & 1 \end{array} \right]$$

$R_2 \leftrightarrow R_3$

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

Answer:

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