

## Review Exercise Set 11

Exercise 1: What is the size of the given matrix?

$$\begin{bmatrix} 1 & -1 \\ -2 & 3 \\ -5 & -6 \end{bmatrix}$$

Exercise 2: The element  $a_{23}$  represents what number in the given matrix?

$$\begin{vmatrix} -6 & 5 & 3 \\ 2 & 0 & -1 \\ 4 & 0 & 7 \end{vmatrix}$$

Exercise 3: Write the following system of linear equations as an augmented matrix.

$$\begin{aligned} -x + 2y + 3z &= 1 \\ 3x - y + z &= -4 \\ x + y - 2z &= 3 \end{aligned}$$

Exercise 4: Write the following system of linear equations as an augmented matrix.

$$\begin{aligned} 3x - 2y + 4z &= -2 \\ x - y - 4z &= 0 \\ y - 3z &= -2 \end{aligned}$$

Exercise 5: Write the following system of linear equations as a matrix equation.

$$\begin{aligned} 3x - 2y &= 2 \\ 3y - 5z &= 1 \\ x + 4z &= -3 \end{aligned}$$

## Review Exercise Set 11 Answer Key

Exercise 1: What is the size of the given matrix?

$$\begin{bmatrix} 1 & -1 \\ -2 & 3 \\ -5 & -6 \end{bmatrix}$$

**The given matrix is a 3x2 matrix because it has 3 rows and 2 columns.**

Exercise 2: The element  $a_{23}$  represents what number in the given matrix?

$$\begin{bmatrix} -6 & 5 & 3 \\ 2 & 0 & -1 \\ 4 & 0 & 7 \end{bmatrix}$$

The first digit in the subscript represents the row and the second digit represents the column, so  $a_{23}$  refers to the element in the third column of row two.

$$\begin{bmatrix} -6 & 5 & 3 \\ 2 & 0 & -1 \\ 4 & 0 & 7 \end{bmatrix}$$

$$\mathbf{a_{23} = -1}$$

Exercise 3: Write the following system of linear equations as an augmented matrix.

$$\begin{aligned} -x + 2y + 3z &= 1 \\ 3x - y + z &= -4 \\ x + y - 2z &= 3 \end{aligned}$$

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

Exercise 4: Write the following system of linear equations as an augmented matrix.

$$\begin{aligned}3x - 2y + 4z &= -2 \\x - y - 4z &= 0 \\y - 3z &= -2\end{aligned}$$

Any missing terms must be added to the system of equations with a zero coefficient.

$$\begin{aligned}3x - 2y + 4z &= -2 \\x - y - 4z &= 0 \\0x + y - 3z &= -2\end{aligned}$$

Augmented matrix for the system

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

Exercise 5: Write the following system of linear equations as a matrix equation.

$$\begin{aligned}3x - 2y &= 2 \\3y - 5z &= 1 \\x + 4z &= -3\end{aligned}$$

Any missing terms must be added to the system of equations with a zero coefficient.

$$\begin{aligned}3x - 2y + 0z &= 2 \\0x + 3y - 5z &= 1 \\x + 0y + 4z &= -3\end{aligned}$$

The matrix equation would be the coefficient matrix times the variable matrix set equal to the constant matrix.

$$\begin{bmatrix} 3 & -2 & 0 \\ 0 & 3 & -5 \\ 1 & 0 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ 1 \\ -3 \end{bmatrix}$$