Math Virtual Learning

College Algebra

May 19, 2020

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Lesson: May 19, 2020

Objective/Learning Target:
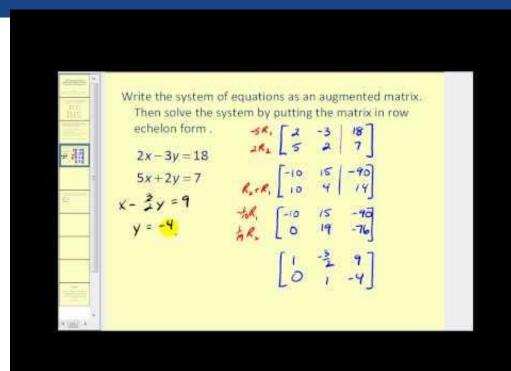Students will use row echelon form to solve systems of equations.

Warm Up Activity:

Look through and practice the three row operations

Row Operations

Lesson:

Watch this video on how to put an augmented matrix into row echelon form. We encourage you to have your own sheet of paper out and work along with the video.

Write the system of equations as an augmented matrix. Then solve the system by putting the matrix in row echelon form.

$2x - 3y = 18$

$5x + 2y = 7$

$-5R_1 \begin{bmatrix} 2 & -3 & | & 18 \\ 5 & 2 & | & 7 \end{bmatrix}$
$2R_2$

$R_2 + R_1 \begin{bmatrix} -10 & 15 & | & -90 \\ 10 & 4 & | & 14 \end{bmatrix}$

$\frac{1}{-10}R_1 \begin{bmatrix} -10 & 15 & | & -90 \\ 0 & 19 & | & -76 \end{bmatrix}$
$\frac{1}{19}R_2$

$\begin{bmatrix} 1 & -\frac{3}{2} & | & 9 \\ 0 & 1 & | & -4 \end{bmatrix}$

$x - \frac{3}{2}y = 9$

$y = -4$

Practice:

Matrix operations and Row Echelon Practice

[Practice](#)

Additional Practice:

Find the reduced row echelon form of each of the following matrices

1)
$$\begin{bmatrix} 1 & 3 & 2 & 1 \\ 2 & -3 & 0 & -2 \end{bmatrix}$$

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

3)
$$\begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & 2 \\ 1 & -3 & -1 \end{bmatrix}$$

4)
$$\begin{bmatrix} 0 & -3 & 2 & -2 \\ 0 & 2 & 2 & -2 \end{bmatrix}$$

Additional Practice Answers: Solutions to Additional Problems 1 - 4

1) $\begin{bmatrix} 1 & 0 & \frac{2}{3} & \frac{-1}{3} \\ 0 & 1 & \frac{4}{9} & \frac{4}{9} \end{bmatrix}$

2) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \\ 0 & 0 \end{bmatrix}$

3) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ ←The Identity Matrix

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