

### Session 3

#### Vocabulary Words:

linear equation  
linear system  
solution of a linear system  
solution set of a linear system  
equivalent linear systems  
consistent/inconsistent linear system  
coefficient matrix of a linear system  
augmented matrix of a linear system  
 $m \times n$  matrix  
elementary row operations  
echelon form/matrix  
reduced echelon form/matrix  
pivot position/column  
row reduction algorithm  
basic variable  
free variable  
general solution  
parameter  
Existence and Uniqueness Theorem  
vectors in  $\mathbb{R}^2$   
addition of vectors  
scalar multiplication of vectors

#### Example:

Employ the row reduction algorithm to find the general solution for the system below.

$$\begin{aligned}x_1 - 2x_2 - x_3 + 3x_4 &= 0 \\ -2x_1 + 4x_2 + 5x_3 - 5x_4 &= 3 \\ 3x_1 - 6x_2 - 6x_3 + 8x_4 &= 2\end{aligned}$$