Students will be able to:

- Produce augmented matrix for a system of equations
- Perform the row operations on an augmented matrix
- Solve systems of linear equations in 3 variables
- Solve systems of linear equations in 4 variables

Functions and symbols that WeBWorK understands.

Links to some useful WeBWorK pages for students

1. (1 pt) The system of equations
   \[
   \begin{align*}
   2x - 3y - z &= 5, \\
   -x + 2y - 5z &= -32, \\
   5x - y - z &= -6
   \end{align*}
   \]
   has a unique solution. Find the solution using Gaussin Elimination method or Gauss-Jordan elimination method.
   \[
   x = \quad y = \quad z = 
   \]

2. (1 pt) The system of equations
   \[
   \begin{align*}
   x + 2y - z &= 0, \\
   x + z &= 0, \\
   2x - y - z &= 16.
   \end{align*}
   \]
   has a unique solution. Find the solution using Gaussin Elimination method or Gauss-Jordan elimination method.
   \[
   x = \quad y = \quad z = 
   \]

3. (1 pt) The system of equations
   \[
   \begin{align*}
   x - 2y + z &= 5, \\
   y + 2z &= 9, \\
   x + y + 3z &= 12
   \end{align*}
   \]
   has a unique solution. Find the solution using Gaussin Elimination method or Gauss-Jordan elimination method.
   \[
   x = \quad y = \quad z = 
   \]

4. (1 pt) Find the formula for quadratic function
   \[y = ax^2 + bx + c\]
   if its graph passes through the following three points:
   \[-1, -4, \quad 2, -7, \quad 3, -4\]
   The formula for the polynomial is
   \[y = \]

5. (1 pt) The system of equations
   \[
   \begin{align*}
   x - 2y + z &= 7, \\
   y + 2z &= -1, \\
   x + y + 3z &= 0
   \end{align*}
   \]
   has a unique solution. Find the solution using Gaussin Elimination method or Gauss-Jordan elimination method.
   \[
   x = \quad y = \quad z = 
   \]

6. (1 pt) Write the augmented matrix of the system
   \[
   \begin{align*}
   -5x + 81y - 45z &= 56, \\
   -68y - 6z &= 9, \\
   89x + 25z &= 10
   \end{align*}
   \]
   perform the following row operations
   (a) \(-1R_1 + R_2 \rightarrow R_2\)
   followed by
   (b) \(3R_1 + R_3 \rightarrow R_3\)
   and then write the resulting augmented matrix below:
   \[
   \begin{matrix}
   \hline
   \hline
   & -5 & 81 & -45 & 56 \\
   \hline
   -68 & 0 & -6 & 9 \\
   89 & 25 & 0 & 10 \\
   \hline
   \end{matrix}
   \]

7. (1 pt) On the augmented matrix \(A\) below
   \[
   A = \begin{bmatrix}
   1 & -2 & -2 \\
   1 & -1 & 5 \\
   -3 & 5 & 5 \\
   \end{bmatrix}
   \]
   perform the following row operations
   (a) \(-1R_1 + R_2 \rightarrow R_2\)
   followed by
   (b) \(3R_1 + R_3 \rightarrow R_3\)
   and then write the resulting augmented matrix below:
   \[
   \begin{matrix}
   \hline
   \hline
   & -5 & 81 & -45 & 56 \\
   \hline
   -68 & 0 & -6 & 9 \\
   89 & 25 & 0 & 10 \\
   \hline
   \end{matrix}
   \]

8. (1 pt) The system of equations
   \[
   \begin{align*}
   2x - 3y - z &= -9, \\
   -x + 2y - 5z &= 22, \\
   5x - y - z &= -14
   \end{align*}
   \]
   has a unique solution. Find the solution using Augmented Matrix and Row Operations.
   \[
   x = \quad y = \quad z = 
   \]
9. (1 pt) The system of equations
\[
\begin{align*}
2x - 9y - 4z &= -17, \\
-x + 5y &= 0, \\
x - 3y - 7z &= -30
\end{align*}
\]
has a unique solution. Find the solution using Augmented Matrix and Row Operations.
\[
x = \\
y = \\
z = 
\]

10. (1 pt) The system of equations
\[
\begin{align*}
w - 4x - 4y - 4z &= -47, \\
3w - 11x - 15y - 10z &= -135, \\
w - 6x + 3y - 12z &= -76 \\
9w - 33x - 44y - 33z &= -417
\end{align*}
\]
has a unique solution. Find the solution using Augmented Matrix and Row Operations.
\[
w = \\
x = \\
y = \\
z = 
\]

11. (1 pt) The system of equations
\[
\begin{align*}
5w - 22x - 28y - 12z &= -42, \\
-2w + 9x + 12y + 4z &= 15, \\
w - 3x + y - 7z &= -20 \\
-4w + 18x + 26y + 11z &= 34
\end{align*}
\]
has a unique solution. Find the solution using Augmented Matrix and Row Operations.
\[
w = \\
x = \\
y = \\
z = 
\]

12. (1 pt) The system of equations
\[
\begin{align*}
w - 4x - 4y - 4z &= 2, \\
2w - 7x - 7y - 9z &= 13, \\
3w - 14x - 13y - 9z &= -16 \\
-4w + 14x + 12y + 17z &= -23
\end{align*}
\]
has a unique solution. Find the solution using Augmented Matrix and Row Operations.
\[
w = \\
x = \\
y = \\
z = 
\]