39b Systems of Linear Equations in 3 or More Variables

Due:
12/15/2015 at 06:00am EST.

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

$$\begin{cases} 2x-3y-z=5, \\ -x+2y-5z=-32, \\ 5x-y-z=-6 \end{cases}$$

has a unique solution. Find the solution using Gaussin elimination method or Gauss-Jordan elimination method.

$x=$ __________
$y=$ __________
$z=$ __________

2. (1 pt) The system of equations

$$\begin{cases} x+2y-z=0, \\ x+z=0, \\ 2x-y-z=16. \end{cases}$$

has a unique solution. Find the solution using Gaussin elimination method or Gauss-Jordan elimination method.

$x=$ __________
$y=$ __________
$z=$ __________

3. (1 pt) The system of equations

$$\begin{cases} x-2y+z=5, \\ y+2z=9, \\ x+y+3z=12 \end{cases}$$

has a unique solution. Find the solution using Gaussin elimination method or Gauss-Jordan elimination method.

$x=$ __________
$y=$ __________
$z=$ __________

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

The formula for the polynomial is
$y=$ ________

5. (1 pt) The system of equations

$$\begin{aligned} x-2y+z&=7, \\ y+2z&=-1, \\ x+y+3z&=0 \end{aligned}$$

has a unique solution. Find the solution using Gaussin elimination method or Gauss-Jordan elimination method.

$x=$ __________
$y=$ __________
$z=$ __________

6. (1 pt) Write the augmented matrix of the system

$$\begin{cases} -5x+81y-45z=56 \\ \quad -68y\ -6z=\ 9 \\ 89x \qquad +25z=10 \end{cases}$$

$$\left[\begin{array}{ccc|c} \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \end{array}\right]$$

7. (1 pt) On the augmented matrix A below

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

perform the following row operations
(a) $-1R_1+R_2 \to R_2$
followed by
(b) $3R_1+R_3 \to R_3$
and then write the resulting augmented matrix below:

$$\left[\begin{array}{ccc|c} \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \end{array}\right]$$

Now perform the following row operation
(c) $1R_2+R_3 \to R_3$
on the matrix you enterd above and then write the resulting augmented matrix below:

$$\left[\begin{array}{ccc|c} \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ & \_\_ \end{array}\right]$$

8. (1 pt) The system of equations

$$\begin{cases} 2x-3y-z=-9, \\ -x+2y-5z=22, \\ 5x-y-z=-14 \end{cases}$$

has a unique solution. Find the solution using Augmented Matrix and Row Operations.

$x=$ __________
$y=$ __________
$z=$ __________

9. (1 pt) The system of equations

$$\begin{cases} 2x-9y-4z=-17, \\ -x+5y=0, \\ x-3y-7z=-30 \end{cases}$$

has a unique solution. Find the solution using Augmented Matrix and Row Operations.
$x =$ ____________
$y =$ ____________
$z =$ ____________

10. (1 pt) The system of equations

$$\begin{cases} w-4x-4y-4z=-47, \\ 3w-11x-15y-10z=-135, \\ w-6x+3y-12z=-76 \\ 9w-33x-44y-33z=-417 \end{cases}$$

has a unique solution. Find the solution using Augmented Matrix and Row Operations.
$w =$ ____________
$x =$ ____________
$y =$ ____________
$z =$ ____________

11. (1 pt) The system of equations

$$\begin{cases} 5w-22x-28y-12z=-42, \\ -2w+9x+12y+4z=15, \\ w-3x+y-7z=-20 \\ -4w+18x+26y+11z=34 \end{cases}$$

has a unique solution. Find the solution using Augmented Matrix and Row Operations.
$w =$ ____________
$x =$ ____________
$y =$ ____________
$z =$ ____________

12. (1 pt) The system of equations

$$\begin{cases} w-4x-4y-4z=2, \\ 2w-7x-7y-9z=13, \\ 3w-14x-13y-9z=-16 \\ -4w+14x+12y+17z=-23 \end{cases}$$

has a unique solution. Find the solution using Augmented Matrix and Row Operations.
$w =$ ____________
$x =$ ____________
$y =$ ____________
$z =$ ____________