

1.(1 pt) Solve the system using substitution

$$\begin{cases} x - 9y = 0 \\ 8x - 73y = -7 \end{cases}$$

x = _____
y = _____

2.(1 pt) Solve the system using substitution

$$\begin{cases} 8x + 3y = -58 \\ -5x - 8y = 24 \end{cases}$$

x = _____
y = _____

3.(1 pt)

Solve the system using elimination

$$\begin{cases} 4x + 9y = -29 \\ -1x + 7y = -39 \end{cases}$$

x = _____
y = _____

4.(1 pt)

Solve the system using elimination

$$\begin{cases} 4x - 4y - 1z = 5 \\ -1x - 4y - 4z = -9 \\ -4x - 1y - 6z = -21 \end{cases}$$

x = _____
y = _____
z = _____

5.(1 pt) You'll need to use formatted text mode in order to do this problem: click the "formatted text" button at the bottom of the page and then click "submit answer".

Write the augmented matrix of the system

$$\begin{cases} -7x + 45y + 10z = -35 \\ \quad + 85y + 6z = 0 \\ -73x \quad + 36z = -81 \end{cases}$$

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

6.(1 pt) You'll need to use formatted text mode in order to do this problem: click the "formatted text" button on the bottom of the page and then click "submit answers".

Perform one step of row reduction, in order to calculate the values for x and y by back substitution. Then calculate the values for x and for y. Also calculate the determinant of the original matrix.

You can let webwork do much of the calculation for you if you want (e.g. enter 45-(56/76)(-3) instead of calculating the value out). You can also use the preview feature in order to make sure that you have used the correct syntax in entering the answer.

[Note- since the determinant is unchanged by row reduction it will be easier to calculate the determinant of the row reduced matrix.]

$$\begin{pmatrix} 25 & 15 \\ -9 & 73 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$$

$$\begin{pmatrix} 25 & 15 \\ 0 & - \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 4 \\ - \end{pmatrix}$$

x = _____
y = _____
det = _____

7.(1 pt) You'll need to use formatted text mode in order to do this problem: click the "formatted text" button on the bottom of the page and then click "submit answers".

Perform one step of row reduction, in order to calculate the values for x and y by back substitution. Then calculate the values for x and for y. Also calculate the determinant of the original matrix.

You can let webwork do much of the calculation for you if you want (e.g. enter 45-(56/76)(-3) instead of calculating the value out). You can also use the preview feature in order to make sure that you have used the correct syntax in entering the answer.

This problem has rather difficult complex calculations.

[Note- since the determinant is unchanged by row reduction it will be easier to calculate the determinant of the row reduced matrix.]

$$\begin{pmatrix} 4 - i & 2 + 3i \\ 3i & i \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 16 + i \\ 6 + 19i \end{pmatrix}$$

$$\begin{pmatrix} 4 - i & 2 + 3i \\ 0 & - \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 16 + i \\ - \end{pmatrix}$$

x = _____
y = _____
det = _____

WARNINGS:

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* This option --tol is not recognized in this subroutine
HASH(0x8bee9c8) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" trTDtol-
/TDTD = gt; /td td nbsp; 0.2 /td /tr /table at (eval128) line 3674.
##More details:
--- main::set_default_options called at (eval 137) line 109
--- main::cplx_cmp called at (eval 53) line 90
--- main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
--- Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
--- PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 590
--- main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 353
--- main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 160

* This option --tol is not recognized in this subroutine
HASH(0x8bee9c8) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" trTDtol-
/TDTD = gt; /td td nbsp; 0.2 /td /tr /table at (eval128) line 3674.
##More details:
--- main::set_default_options called at (eval 137) line 109
--- main::cplx_cmp called at (eval 53) line 92
--- main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
--- Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
--- PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 590
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8.(1 pt)

Solve the system using matrices (row operations)

$$\begin{cases} -8x+5y= 89 \\ 1x-6y=-38 \end{cases}$$

$x =$ _____

$y =$ _____

9.(1 pt)

Solve the system using matrices (row operations)

$$\begin{cases} 6x+3y+1z= 10 \\ 1x-2y+6z=-10 \\ 2x-1y+4z= -4 \end{cases}$$

$x =$ _____

$y =$ _____

$z =$ _____

10.(1 pt)

For each system, determine whether it has a unique solution (in this case, find the solution), infinitely many solutions, or no solutions.

1.

$$\begin{cases} -5x +5y= 35 \\ 15x-15y=-105 \end{cases}$$

- A. Unique solution: $x = 35, y = -105$
- B. Unique solution: $x = 0, y = 0$
- C. No solutions
- D. Infinitely many solutions
- E. Unique solution: $x = \frac{35}{-5}, y = 0$
- F. None of the above

2.

$$\begin{cases} 9x-4y=0 \\ 7x+3y=0 \end{cases}$$

- A. Infinitely many solutions
- B. No solutions
- C. Unique solution: $x = -3, y = 9$
- D. Unique solution: $x = 5, y = 10$
- E. Unique solution: $x = 0, y = 0$
- F. None of the above

3.

$$\begin{cases} -5x-2y=-20 \\ 15x+6y= 61 \end{cases}$$

- A. Unique solution: $x = 0, y = 0$
- B. No solutions
- C. Unique solution: $x = -20, y = 61$
- D. Infinitely many solutions
- E. Unique solution: $x = 61, y = -20$
- F. None of the above

4.

$$\begin{cases} 1x-10y= 63 \\ 1x +5y=-27 \end{cases}$$

- A. No solutions
- B. Unique solution: $x = 3, y = -6$
- C. Unique solution: $x = 0, y = 0$
- D. Unique solution: $x = -6, y = 3$
- E. Infinitely many solutions
- F. None of the above

11.(1 pt)

Solve the system by using Cramer's Rule.

$$\begin{cases} 6x+9y=-78 \\ 1x+1y= -8 \end{cases}$$

$x =$ _____

$y =$ _____

12.(1 pt) Determine the value of h such that the matrix is the augmented matrix of a consistent linear system.

$$\left[\begin{array}{cc|c} 6 & -5 & h \\ -18 & 15 & 8 \end{array} \right]$$

$h =$ _____

13.(1 pt) Determine the value of h such that the matrix is the augmented matrix of a consistent linear system.

$$\left[\begin{array}{cc|c} 3 & -4 & 7 \\ 6 & h & 14 \end{array} \right]$$

$h =$ _____

14.(1 pt) You will need to use formatted text mode in order to do this problem: click the "formatted text" button at the bottom of the page and then click "submit answer".

A dietician is planning a meal that supplies certain quantities of vitamin C, calcium, and magnesium. Three foods will be used, their quantities measured in milligrams. The nutrients supplied by these foods and the dietary requirements are given in the table below.

Nutrient	Food 1	Food 2	Food 3	Total Required (mg)
Vitamin C	20	20	30	2010
Calcium	10	25	35	2005
Magnesium	50	60	95	5865

Write the augmented matrix for this problem.

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

What quantity (mg) of Food 1 is necessary to meet the dietary requirements?

What quantity (mg) of Food 2 is necessary to meet the dietary requirements?

What quantity (mg) of Food 3 is necessary to meet the dietary requirements?