**Systems of Linear Equations, Matrices and Determinants**

Select the correct answer or enter the answers in the spaces provided.

**(1)** \_\_\_\_\_\_\_\_\_\_ Solve the system of linear equations by substitution.

+ *x* + 4 *y* = + 13

− *x* − 3 *y* = − 11

**(2)** \_\_\_\_\_\_\_\_\_\_ Solve the system of linear equations by elimination.   
  
 1 *x* + 4 *y* = 2

2 *x* − 1 *y* = 1

**(3)** \_\_\_\_\_\_\_\_\_\_ Determine the Quadrant, in the Cartesian Coordinate System, that contains the solution to this system.

3 *x* + 5 *y* = + 20

1 *x* + 7 *y* = − 14

Also, sketch the graph of the system using the provided coordinate grid. Label the axes and scale the grid accordingly.

Label the point of intersection.

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**(4)** \_\_\_\_\_\_\_\_\_\_ For this linear system, determine the determinant of the matrix of coefficients.

+ 2 *a* − 3 *b* = 06

− 2 *a* + 3 *b* = 12

**(5)** \_\_\_\_\_\_\_\_\_\_ Find the equilibrium point for this demand and supply equation system, where *p* is the price and *x* is the number of units that satisfy both the demand and supply equations.

*p* = $ 400 − $ 0.002 *x* *demand equation*

*p* = $ 225 + $ 0.005 *x* *supply equation*

**(6)** \_\_\_\_\_\_\_\_\_\_ When using Cramer’s Rule to solve the given system of linear equations, what would be the determinant *D x* of the numerator in the solution for the *x* variable only?

+ 1 *x* − 4 *y* = 9

− 3 *x* = 12 *y* − 30

**(7)** \_\_\_\_\_\_\_\_\_\_ Determine whether the system has one solution, no solution or an infinite number of solutions.

1 *m* + 3 *n* = 06

1 *m* + 2 *n* = 12

\_\_\_\_\_\_\_\_\_\_ Determine whether the system has one solution, no solution or an infinite number of solutions.

1 *m* + 3 *n* = 06

1 *m* + 3 *n* = 12

\_\_\_\_\_\_\_\_\_\_ Determine whether the system has one solution, no solution or an infinite number of solutions.

3 *m* + 2 *n* = 06

6 *m* + 4 *n* = 12

**(8)** \_\_\_\_\_\_\_\_\_\_ Evaluate the following 3 by 3 determinant.

|  |  |  |
| --- | --- | --- |
| + 2 | − 1 | + 4 |
| + 0 | + 8 | + 1 |
| − 3 | + 5 | + 6 |

**(9)** \_\_\_\_\_\_\_\_\_\_ Solve this 3 by 3 system of linear equations.

− 4 *u* + 7 *v* − 10 *w* = + 35

+ 5 *u* + 5 *v* − 02 *w* = + 09  
+ 2 *u* − 3 *v* − 04 *w* = − 41

**(10)** \_\_\_\_\_\_\_\_\_\_ Solve the 3 by 3 system of linear equations.

+ 1 *u* + 10 *v* = − *w* + 52

− 5 *u* = *v* + 4 *w* − 15  
+ 1 *u* + 2 *v* − 3 *w* = 12