Math 113 – Sample Exam: Systems of Linear Equations

Solve each system of linear equations using **substitution**

1.) $\begin{aligned} 3x - y &= 1 \\ x + 2y &= -9 \end{aligned}$

2.) $\begin{aligned} x - y &= 5 \\ -3x + 2y &= 24 \end{aligned}$

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3.) $\begin{aligned} r + s &= 0 \\ r - s &= 5 \end{aligned}$

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4.) $\begin{aligned} 3x - 5y &= 16 \\ 15x + 5y &= 20 \end{aligned}$

Solve each system of linear equations using **elimination**

5.) $\begin{aligned} 5x + y &= 4 \\ 3x + 2y &= 1 \end{aligned}$

6.) $\begin{aligned} 2x - 2y &= 12 \\ -2x + 3y &= 10 \end{aligned}$

7.) $\begin{aligned} 2x - y &= 1 \\ 3x - y &= 6 \end{aligned}$

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8.) $\begin{aligned} 2x - 3y &= -1 \\ 10x + y &= 11 \end{aligned}$

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Determine if the following systems of linear equations have (a.) one solution. (b.) infinitely many solutions, or (c.) no solutions. Find all the solutions, if possible. Then give a geometric interpretation of the linear system. (Lines intersect, are parallel, or it is the same line)

9.) $\begin{aligned} -6x + 4y &= 7 \\ 3x - 2y &= 4 \end{aligned}$

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10.) $\begin{aligned} 3x - 4y &= 1 \\ 2x + 3y &= 12 \end{aligned}$

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11.) $$\begin{aligned} -4x + y &= 2 \\ 8x - 2y &= -4 \end{aligned}$$

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12.) The Blue & Gold movie theater charges $9.00 for adults and $7.00 for senior citizens. On a day when 325 people paid an admission, the total receipts were $2495. How many who paid were adults? How many were seniors?

Adults _____

Seniors _____

13.) A child has 25 coins in a piggy bank consisting of dimes and quarters. The total value of the coins is $3.70. Find the number of dimes and the number of quarters.

Dimes _____

Quarters _____

14.) A restaurant manager wants to purchase 200 sets of dishes. One design costs $25 per set, while another costs $45 per set. If she only has $7400 to spend, how many of each design should be ordered?

$25 set _____

$45 set

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