

Identity [Matrix]

Mr. Doherty
Algebra 2

Name: _____
Date: _____

Chapter 3 Practice Test

- 1) Is the given ordered triple (2, 1, 3) a solution of the system below? (no calc)

$$2x - y + 5z = 16 \quad \text{No}$$

$$x - 3y + 2z = 5$$

$$(x + 2y + z = 7)$$

$$-5y + z = 8$$

$$-2x + 6y - 4z = -10$$

$$5y + z = 6$$

$$2 - 12 = -10$$

- 2) Solve the linear systems below using either elimination method, or substitution method. (no calc)

a) $4x - 3y = 12$
 $-16x + 12y = 1$

$$16x - 12y = 48$$

$$0 = 49 \quad \text{No Solution}$$

b) $5x + y = 16$
 $-3x + y = 0$
 $y = 3x$

$$8x = 16$$

$$x = 2$$

$$y = 6$$

$$(2, 6)$$

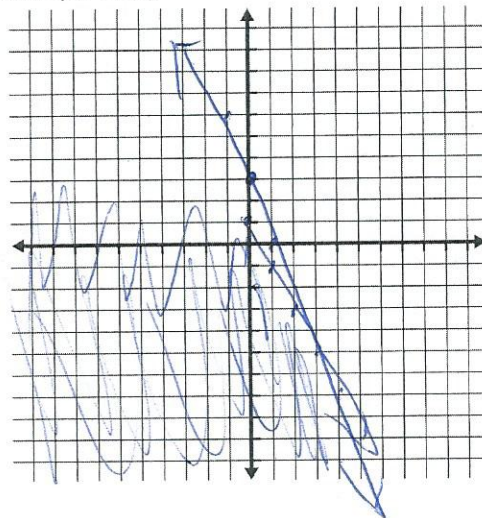
- 3) Graph the system of inequalities on the axis below. (no calc)

$$x + 2y < 2$$

$$3x + y \leq 3$$

$$y < 3 - 3x$$

$$y \leq 3 - \frac{1}{2}x$$



give an equation that has infinite solutions

- 4) Use the given matrices below to perform the operations below. If the expression is undefined, state why. Show all work.

$$A = \begin{bmatrix} -1 & -3 \\ 2 & 0 \end{bmatrix}$$

$$B = \begin{matrix} 3 \times 2 \\ \begin{bmatrix} -1 & 0 \\ 2 & 3 \\ 1 & -2 \end{bmatrix} \end{matrix}$$

$$C = \begin{bmatrix} 1 & -4 \\ 3 & -2 \end{bmatrix}$$

a) (No calc) $A - C$

$$\begin{bmatrix} -2 & 1 \\ -1 & 2 \end{bmatrix}$$

b) (No Calc) $A \cdot C$

$$\begin{bmatrix} -1 & -9 & 10 \\ 2 & & -8 \end{bmatrix}$$

$$= \begin{bmatrix} -10 & 10 \\ 2 & -8 \end{bmatrix}$$

c) $B \cdot A$

$$\begin{bmatrix} 1 & 3 \\ 4 & -6 \\ -5 & -3 \end{bmatrix}$$

d) (No Calc) $3C$

$$\begin{bmatrix} 3 & -12 \\ 9 & -6 \end{bmatrix}$$

e) $B(A+C)$

$$\begin{bmatrix} 0 & 7 \\ 15 & -20 \\ -10 & -3 \end{bmatrix}$$

f) $B \cdot A + B \cdot C$

$$\begin{bmatrix} 1 & 3 \\ 4 & -6 \\ -5 & -3 \end{bmatrix}$$

$$\begin{bmatrix} 0 & 7 \\ 15 & -20 \\ -10 & -3 \end{bmatrix}$$

- 5) Find a matrix equation that could be used to solve the following equation. Use that matrix equation to solve the two variable system.

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

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

-5, 3

- 6) Calculate the following determinates.

a) $\det \begin{bmatrix} -2 & 0 & 3 \\ -2 & 4 & 2 \\ 1 & 1 & 0 \end{bmatrix} = -14$

b)(no calc) $\det \begin{bmatrix} 2 & -6 \\ 7 & -3 \end{bmatrix} = -6 - (-42) = -6 + 42 = 36$

- 7) Given the three variable linear system below find the coefficient matrix A. Use the coefficient matrix to set up a matrix equation. Finally solve the equation and state the solution for the system.

$$\begin{aligned}2x - 5y + 2z &= 2 \\ -3x + y - 6z &= 3 \\ x + y + z &= 1\end{aligned}$$

$$\begin{bmatrix} 2 & -5 & 2 \\ -3 & 1 & -6 \\ 1 & 1 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix}$$

- 8) Solve the matrix equation below.

$$\begin{bmatrix} 4 & 3 \\ 2 & 2 \end{bmatrix} X = \begin{bmatrix} -2 & 3 \\ -1 & 2 \end{bmatrix}$$

$$\begin{bmatrix} -\frac{1}{2} & 0 \\ 0 & 1 \end{bmatrix}$$

$$(3, 0, -2)$$

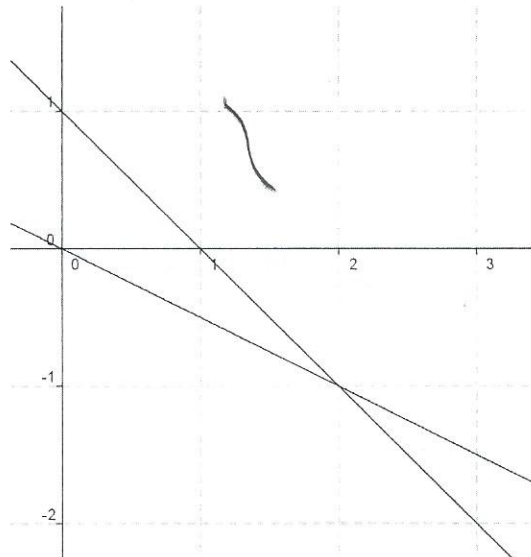
9) Describe what type of linear systems would have the following scenarios:

No solution- Parallel

One solution- one intersection

Infinite solutions- Same line

10) What is the solution of the system of linear equations that is graphed below?



(2, -1)

11) During one calendar year, a state trooper issued a total of 375 citations for warnings and speeding tickets. Of the 375, there were 37 more warnings than speeding tickets. Create a system of equations that you could solve to find the number of speeding tickets and the number of warnings issued and then solve the system.

~~W~~

$$W + S = 375$$

$$S + 37 = W$$

$$2S + 37 = 375$$

$$\begin{aligned} S &= 169 \\ W &= 206 \end{aligned}$$