

Welcome Back MYP Math 9!

Self-assess:

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>9/25</u> Topic: <u>System Applications</u>	0 1 2	I tried the 3 variable system!
Tuesday Date: <u>9/26</u> Topic: <u>Matrices!</u>	0 1 2	I tried the 3 variable system!
Wednesday Date: <u>9/26</u> Topic: <u>Day 2: Matrices</u>	0 1 2	Re-arranging my terms was a small challenge.
Thursday Date: <u>9/28</u> Topic: <u>Day 3: Matrices</u>	0 1 2	I finished old problems!
Friday Date: _____ Topic: _____	0 1 2	

Class Plan

1. Quiz 1.2 Rubric
 - How will I be assessed?
 - What should I study?
 - What are my resources?
2. Joke break :)
3. Quiz 1.2 Review
 - Solutions are posted!
4. Exercises: STUDY!

Criterion A: Knowing and Understanding

Quiz 1.2 Rubric

-How will I be assessed?

Name _____		Course: IB MYP 9 Math Extended Level Teachers: Berg, Connelly, Oberembt, Paulson, Perkins	
<p>UNIT1 Linear: Relationships Key Concept: Relationships Related Concept(s): Change, System Global Context: Scientific and technical innovation Statement of Inquiry: Investigating changes among systems enables us to understand relationships in our world. Task Title: Solving Systems of Equations Quiz Task Description: Students will demonstrate their understanding of graphing and using substitution to solve a system of equations.</p>			
7	<ul style="list-style-type: none"> Select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations. 		<ul style="list-style-type: none"> All problems are solved correctly without error
8	<ul style="list-style-type: none"> Apply the selected mathematics successfully when solving these problems. Generally solve these problems correctly. 		<ul style="list-style-type: none"> Variables defined correctly Unfamiliar situation of using at least 3 methods to solve is demonstrated Matrix rules are identified and written correctly

Tomorrow's Quiz:

Systems of Linear Equations

- **Solve by graphing**

What are the forms of equations? How do we graph each form?

- **Solve by substitution**
- **Solve by elimination**
- **Solve using matrices**

How do I solve a system of equations using matrices?

- **Real-life application**

How can I model this real-life situation using a system of equations? What are the questions asking for?

Joke Break :)

After explaining to a student through various lessons and examples that:

$$\lim_{x \rightarrow 8} \frac{1}{x-8} = \infty$$

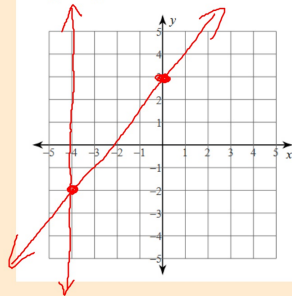
I tried to check if she really understood that, so I gave her a different example.

This was the result:

$$\lim_{x \rightarrow 5} \frac{1}{x-5} = \infty$$

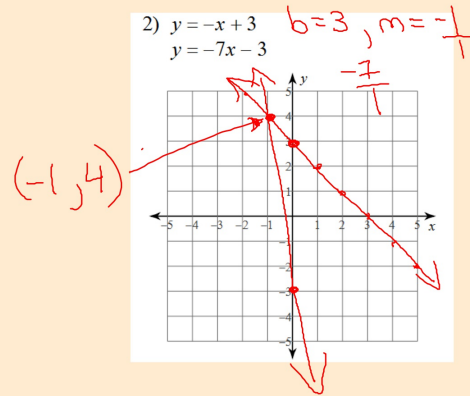
Solve the system by graphing.

1) $y = \frac{5}{4}x + 3$
 $x = -4$

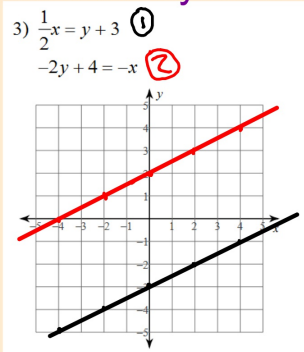


$(-4, -2)$

Solve the system by graphing.



Solve the system by graphing.



$$\frac{1}{2}x - 3 = y \quad \text{①}$$

$$m = \frac{1}{2}$$

$$b = -3$$

$$y = \frac{1}{2}x + 2 \quad \text{②}$$

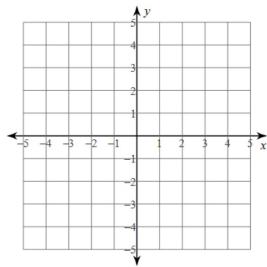
$$m = \frac{1}{2}$$

$$b = 2$$

no solution

Solve the system by substitution.

$$4) \begin{cases} -2x = -y - 4 \\ 2x = 4 + y \end{cases} \xrightarrow{(-1)} 2x = y + 4$$



$$x = 2x - 4$$

Infinite Solutions

Solve the system by substitution.

$$5) \begin{cases} y = 5x + 7 \\ y = 2x - 2 \end{cases}$$

$$y = 5(-3) + 7$$

$$y = -15 + 7$$

$$y = -8$$

$$5x + 7 = 2x - 2$$

$$\begin{array}{r} -7 \quad -7 \\ \hline 5x = 2x - 9 \end{array}$$

$$5x = 2x - 9$$

$$-2x \quad -2x$$

$$\begin{array}{r} 3x = -9 \\ \hline \frac{3x}{3} = \frac{-9}{3} \end{array}$$

$$x = -3$$

Solve the system by substitution.

$$\begin{aligned} 6) \quad & y = -4x + 22 \\ & -12x - 3y = -66 \\ & 4x + y = 22 \end{aligned}$$

$$\left[\begin{array}{cc|c} -12 & -3 & -66 \\ 4 & 1 & 22 \end{array} \right]$$

$$3R_2 + R_1 \rightarrow R_2 \quad \left[\begin{array}{cc|c} -12 & -3 & -66 \\ 0 & 0 & 0 \end{array} \right] \quad \leftarrow \text{Same equations}$$

Infinite Solutions

Solve the system by substitution.

$$\begin{aligned} 7) \quad & -5x - y = 0 \\ & y = -5x + 1 \end{aligned}$$

$$y = -5x \quad \left[\begin{array}{cc|c} -5 & -1 & 0 \\ 5 & 1 & 1 \end{array} \right] \quad -R_1 \rightarrow R_1$$

$$\left[\begin{array}{cc|c} 5 & 1 & 0 \\ 5 & 1 & 1 \end{array} \right] \quad -R_1 + R_2 \rightarrow \left[\begin{array}{cc|c} 5 & 1 & 0 \\ 0 & 0 & 1 \end{array} \right]$$

NO SOLUTION

Solve the system by substitution.

$$\begin{aligned} 8) \quad & -3x + 4y = -24 \\ & -x + y = -8 \end{aligned}$$

$$\left[\begin{array}{cc|c} -3 & 4 & -24 \\ -1 & 1 & -8 \end{array} \right] R_2 \leftrightarrow R_1 \rightarrow \left[\begin{array}{cc|c} -1 & 1 & -8 \\ -3 & 4 & -24 \end{array} \right] -1R_1 \rightarrow \left[\begin{array}{cc|c} 1 & -1 & 8 \\ -3 & 4 & -24 \end{array} \right]$$

$$3R_1 + R_2 \rightarrow R_2 \rightarrow \left[\begin{array}{cc|c} 1 & -1 & 8 \\ 0 & 1 & 0 \end{array} \right]$$

$$R_1 + R_2 \rightarrow R_1 \rightarrow \left[\begin{array}{cc|c} 1 & 0 & 8 \\ 0 & 1 & 0 \end{array} \right]$$

$$\begin{cases} x = 8 \\ y = 0 \end{cases}$$

Solve the system by elimination.

$$\begin{aligned} 9) \quad & (6x + 8y = 5) \cdot 2 \\ & -12x - 16y = -24 \end{aligned}$$

$$\begin{array}{r} 12x + 16y = 10 \\ + \quad -12x - 16y = -24 \\ \hline 0x - 0y = -14 \end{array}$$

$$0 \neq -14$$

No solution

Solve the system by elimination.

$$10) \begin{cases} -8x + 4y = -4 \\ -9x + 5y = 0 \end{cases}$$

$$\begin{aligned} 40x - 20y &= 20 \\ -36x + 20y &= 0 \end{aligned}$$

$$-8(5) + 4y = -4$$

$$-40 + 4y = -4$$

$$\frac{4y}{4} = \frac{36}{4}$$

$$y = 9$$

$$\frac{4x}{4} = \frac{20}{4}$$

$$x = 5$$

$$(5, 9)$$

Solve by a method of your choice.

11) Brenda and Micaela are selling wrapping paper for a school fundraiser. Customers can buy rolls of plain wrapping paper and rolls of shiny wrapping paper. Brenda sold 12 rolls of plain wrapping paper and 5 rolls of shiny wrapping paper for a total of \$328. Micaela sold 6 rolls of plain wrapping paper and 11 rolls of shiny wrapping paper for a total of \$334. Find the cost each of one roll of plain wrapping paper and one roll of shiny wrapping paper.

$$12p + 5s = 328$$

$$(6p + 11s = 334)(-2)$$

$$12p + 5s = 328$$

$$-12p - 22s = -668$$

$$\frac{-17s = -340}{-17}$$

$$s = \$20$$

P: \$ of plain
S: \$ of shiny

$$6p + 11(20) = 334$$

$$6p + 220 = 334$$

$$\frac{-220}{-220} \quad \frac{-220}{-220}$$

$$6p = 114$$

$$p = \$19$$

Solve by a method of your choice.

12) The school that Julio goes to is selling tickets to the annual dance competition. On the first day of ticket sales the school sold 5 senior citizen tickets and 14 child tickets for a total of \$77. The school took in \$76 on the second day by selling 10 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

x : Senior Citizens \$
 y : Children \$

1st day $(5x + 14y = 77) \cdot (-2)$

2nd day $10x + 2y = 76$
 $-10x - 28y = -154$

$-26y = -78$
 $y = 3.00$

$10x + 2(3) = 76$
 $10x + 6 = 76$
 $10x = 70$
 $x = 7.00$

Solve by row reduction.

13) $-2x - 10y = -4$
 $-x - 20y = -17$

$$\left[\begin{array}{cc|c} -2 & -10 & -4 \\ -1 & -20 & -17 \end{array} \right] \xrightarrow{\substack{-\frac{1}{2}R_1 \\ \rightarrow R_1}} \left[\begin{array}{cc|c} 1 & 5 & 2 \\ -1 & -20 & -17 \end{array} \right] \xrightarrow{R_1 + R_2} \left[\begin{array}{cc|c} 1 & 5 & 2 \\ 0 & -25 & -15 \end{array} \right]$$

$$\left[\begin{array}{cc|c} 1 & 5 & 2 \\ 0 & -25 & -15 \end{array} \right] \xrightarrow{\substack{-\frac{1}{25}R_2 \\ \rightarrow R_2}} \left[\begin{array}{cc|c} 1 & 5 & 2 \\ 0 & 1 & \frac{3}{5} \end{array} \right] \xrightarrow{-5R_2 + R_1} \left[\begin{array}{cc|c} 1 & 0 & -\frac{1}{5} \\ 0 & 1 & \frac{3}{5} \end{array} \right] \xrightarrow{\rightarrow R_1} \left[\begin{array}{cc|c} 1 & 0 & -3 \\ 0 & 1 & 1 \end{array} \right]$$

$$\left[\begin{array}{cc|c} 1 & 0 & -3 \\ 0 & 1 & 1 \end{array} \right] \quad (-3, 1)$$

Solve by row reduction.

$$14) \quad -4x + 4y = -20$$

$$2x + 8y = 20$$

$$\begin{bmatrix} -4 & 4 & | & -20 \\ 2 & 8 & | & 20 \end{bmatrix} \xrightarrow{\substack{-\frac{1}{4}R_1 \\ \rightarrow R_1}} \begin{bmatrix} 1 & -1 & | & 5 \\ 2 & 8 & | & 20 \end{bmatrix} \xrightarrow{\substack{-2R_1+R_2 \\ \rightarrow R_2}} \begin{bmatrix} 1 & -1 & | & 5 \\ 0 & 10 & | & 10 \end{bmatrix}$$

$$\xrightarrow{\substack{\frac{1}{10}R_2 \\ \rightarrow R_2}} \begin{bmatrix} 1 & -1 & | & 5 \\ 0 & 1 & | & 1 \end{bmatrix} \xrightarrow{\substack{R_2+R_1 \\ \rightarrow R_1}} \begin{bmatrix} 1 & 0 & | & 6 \\ 0 & 1 & | & 1 \end{bmatrix} \quad (6, 1)$$

Solve by row reduction.

$$15) \quad -4x + 2z = -4$$

$$3x - 4y - 2z = 1$$

$$3x + 3y - 2z = 8$$

$$\begin{aligned} -4x + 0y + 2z &= -4 \\ 3x - 4y - 2z &= 1 \\ 3x + 3y - 2z &= 8 \end{aligned}$$

$$\begin{bmatrix} -4 & 0 & 2 & | & -4 \\ 3 & -4 & -2 & | & 1 \\ 3 & 3 & -2 & | & 8 \end{bmatrix} \xrightarrow{-\frac{1}{4}R_1} \begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 3 & -4 & -2 & | & 1 \\ 3 & 3 & -2 & | & 8 \end{bmatrix} \xrightarrow{\substack{-1R_3+R_2 \\ \frac{z}{2}+z}} \begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 0 & -7 & 0 & | & -7 \\ 3 & 3 & -2 & | & 8 \end{bmatrix}$$

$$\xrightarrow{\frac{1}{7}R_2} \begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 0 & 1 & 0 & | & 1 \\ 3 & 3 & -2 & | & 8 \end{bmatrix} \xrightarrow{-3R_1+R_3} \begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 0 & 1 & 0 & | & 1 \\ 0 & 3 & -\frac{1}{2} & | & 5 \end{bmatrix} \xrightarrow{-3R_2+R_3}$$

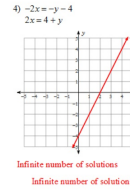
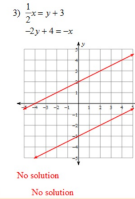
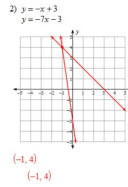
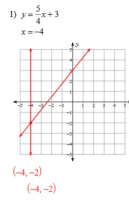
$$\begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 0 & 1 & 0 & | & 1 \\ 0 & 0 & -\frac{1}{2} & | & 2 \end{bmatrix} \xrightarrow{2R_3} \begin{bmatrix} 1 & 0 & -\frac{1}{2} & | & 1 \\ 0 & 1 & 0 & | & 1 \\ 0 & 0 & 1 & | & -4 \end{bmatrix} \xrightarrow{\frac{1}{2}R_3+R_1}$$

$$\begin{bmatrix} 1 & 0 & 0 & | & -7 \\ 0 & 1 & 0 & | & 1 \\ 0 & 0 & 1 & | & -4 \end{bmatrix} \quad \begin{aligned} x &= -7 \\ y &= 1 \\ z &= -4 \end{aligned} \quad (-7, 1, -4)$$

QUIZ REVIEW SOLUTIONS

Answers to Graphing, Substitution, Elimination, Applications, and Matrices (ID: 1)

- 1) $(-4, -2)$ 2) $(-1, 4)$ 3) No solution
4) Infinite number of solutions 5) $(-3, -8)$ 6) Infinite number of solutions
7) No solution 8) $(8, 0)$ 9) No solution 10) $(5, 9)$
11) roll of plain wrapping paper: \$19, roll of shiny wrapping paper: \$20
12) senior citizen ticket: \$7, child ticket: \$3 13) $(-3, 1)$ 14) $(6, 1)$
15) $(-1, 1, -4)$



Exercises: Review for your quiz!

After school help
W124 OR Garage 118A