

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>9/27</u> Topic: <u>Day 2: Matrices</u>	0 1 2	Re-arranging my terms was a small challenge.
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up: Solve the systems of equations using 2 methods.

$$\begin{aligned} -4x - 6y &= -8 \\ -8x - 12y &= -16 \end{aligned}$$

$$\left[\begin{array}{cc|c} -4 & -6 & -8 \\ -8 & -12 & -16 \end{array} \right]$$

$$\begin{aligned} -2R_1 + R_2 &\rightarrow R_2 \\ \text{truth} & \text{ (same line)} \end{aligned}$$

$$\left[\begin{array}{cc|c} -4 & -6 & -8 \\ 0 & 0 & 0 \end{array} \right]$$

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

$$\left[\begin{array}{cc|c} 1 & 2 & -2 \\ 1 & 2 & -6 \end{array} \right] \begin{array}{l} -R_1 + R_2 \\ \rightarrow R_2 \end{array}$$

$$\left[\begin{array}{cc|c} 1 & 2 & -2 \\ 0 & 0 & -4 \end{array} \right]$$

$$0x + 0y = -4$$

NO SOLUTION

Solving by Elimination & Matrices

$$-4x - 6y = -8$$

$$-8x - 12y = -16$$

Solving by Elimination & Matrices

$$\begin{array}{r} -2(-4x - 6y = -8) \\ -8x - 12y = -16 \end{array} \quad \begin{array}{r} 8x + 12y = 16 \\ + -8x - 12y = -16 \\ \hline \end{array}$$

$$\begin{array}{l} 0x + 0y = 0 \\ \text{True, } 0=0 \checkmark \end{array}$$
$$\left[\begin{array}{cc|c} -4 & -6 & -8 \\ -8 & -12 & -16 \end{array} \right] \xrightarrow[-R_2]{-2R_1+R_2} \left[\begin{array}{cc|c} -4 & -6 & -8 \\ 0 & 0 & 0 \end{array} \right]$$

∞ SOLUTIONS, WHY?

$$\textcircled{1} -4x - 6y = -8$$

$$\textcircled{2} -8x - 12y = -16$$

$$-4x - 6y = -8$$

$$\frac{-6y}{-6} = \frac{4x + 8}{-6}$$

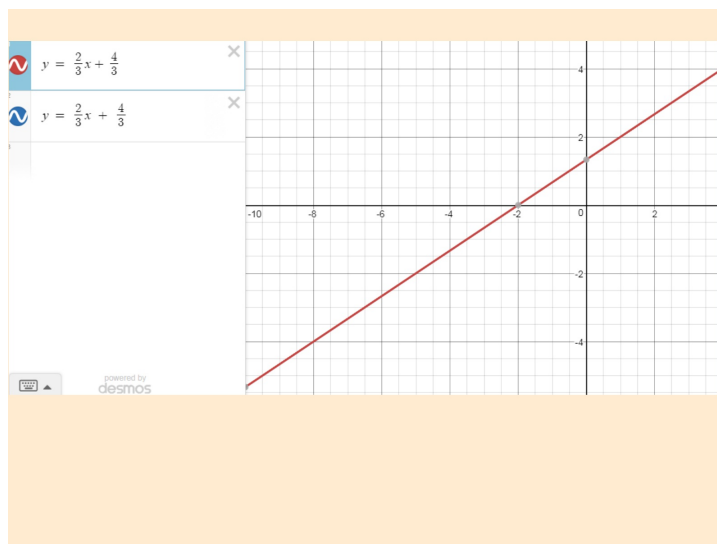
$$y = -\frac{2}{3}x - \frac{4}{3}$$

$$-8x - 12y = -16$$

$$\frac{-12y}{-12} = \frac{8x - 16}{-12}$$

$$y = -\frac{2}{3}x - \frac{4}{3}$$

COINCIDING LINES!



Solving by Elimination & Matrices

$$x + 2y = -2$$

$$x + 2y = -6$$

Solving by Elimination & Matrices

$$\begin{array}{r} -(x + 2y = -2) \quad -x - 2y = 2 \\ x + 2y = -6 \quad + \quad x + 2y = -6 \\ \hline \end{array}$$

$$0x + 0y = -4$$

False, $0 \neq -4$

$$\left[\begin{array}{cc|c} 1 & 2 & -2 \\ 1 & 2 & -6 \end{array} \right] \xrightarrow[-R_2]{-R_1+R_2} \left[\begin{array}{cc|c} 1 & 2 & -2 \\ 0 & 0 & -4 \end{array} \right]$$

No solution, WHY?

$$\textcircled{1} x + 2y = -2$$

$$\textcircled{2} x + 2y = -6$$

$$\textcircled{1} x + 2y = -2$$

$$\frac{2y}{2} = \frac{-x-2}{2}$$

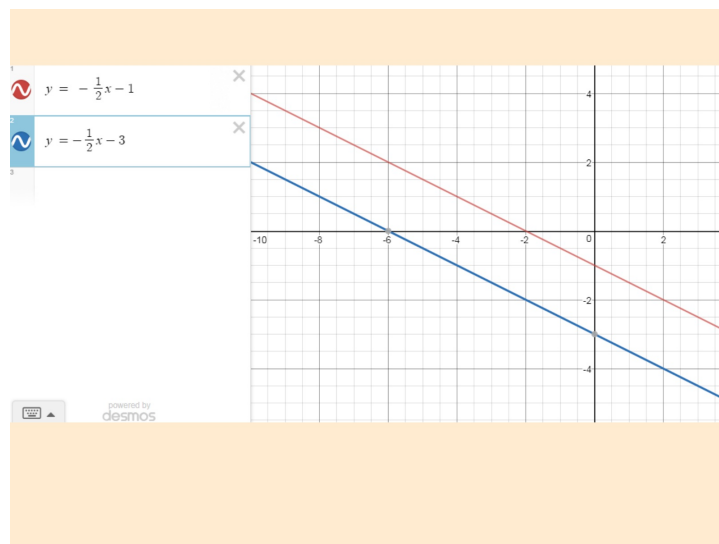
$$y = -\frac{1}{2}x - 1$$

$$\textcircled{2} x + 2y = -6$$

$$\frac{2y}{2} = \frac{-x-6}{2}$$

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

Parallel lines!



Class Plan

1. Warm-up
2. Matrices in calculator
3. Hand back Quiz 1
4. Exercises, practice

$$\left[\begin{array}{cc|c} 1 & 0 & h \\ 0 & 1 & k \end{array} \right] \quad \text{or} \quad \left[\begin{array}{ccc|c} 1 & 0 & 0 & p \\ 0 & 1 & 0 & q \\ 0 & 0 & 1 & r \end{array} \right]$$

Let's do this with our calculator:

$$\begin{array}{l} 4) \quad -5y + 21 + 7x = 0 \\ \quad -2x = -12 - 4y \end{array} \quad \begin{array}{l} 7x - 5y = -21 \\ -2x + 4y = -12 \end{array}$$

$$\begin{array}{l} \left[\begin{array}{cc|c} 7 & -5 & -21 \\ -2 & 4 & -12 \end{array} \right] \xrightarrow[3R_2+R_1]{\rightarrow R_1} \left[\begin{array}{cc|c} 1 & 7 & -57 \\ -2 & 4 & -12 \end{array} \right] \\ 2R_1+R_2 \xrightarrow{\rightarrow R_2} \left[\begin{array}{cc|c} 1 & 7 & -57 \\ 0 & 18 & -126 \end{array} \right] \xrightarrow[\frac{1}{18}R_2]{\rightarrow R_2} \left[\begin{array}{cc|c} 1 & 7 & -57 \\ 0 & 1 & -7 \end{array} \right] \\ -7R_2+R_1 \xrightarrow{\rightarrow R_1} \left[\begin{array}{cc|c} 1 & 0 & -8 \\ 0 & 1 & -7 \end{array} \right] \quad (-8, -7) \end{array}$$

Additional example using calculator:

4) $-5y + 21 + 7x = 0$
 $-2x = -12 - 4y$

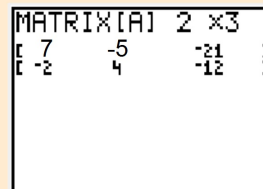
$7x - 5y = -21$
 $-2x + 4y = -12$

Enter the matrix!

1) 2nd, x^{-1} , EDIT, ENTER



2) 2 X 3, Enter equation values



Additional example using calculator:

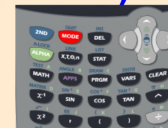
4) $-5y + 21 + 7x = 0$
 $-2x = -12 - 4y$

$7x - 5y = -21$
 $-2x + 4y = -12$

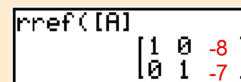
Enter the matrix!

3) 2nd, MODE (go to main screen)

4) 2nd, x^{-1} , MATH, "rref("



5) 2nd, x^{-1} , ENTER



Exercises:

Systems Matrices Day 2 Worksheet

1) $6x - y = 14$
 $-6x + 2y = -10$

2) $-6x + 8y = 2$
 $3x + 7y = 10$

3) $-2x + y = -4$
 $12x - 3y = 30$

4) $-5y + 21 + 7x = 0$
 $-2x = -12 - 4y$

5) $-x - 2y + z = 2$
 $4x + y - z = -4$
 $-x - 2y + 4z = 20$

6) $-4x - 5z = -3$
 $-5x - y - z = 9$
 $-2x - 6y + z = -9$

Answers to 9-26 Extended Level Homework

1) (3, 4)
5) (0, 2, 6)

2) (1, 1)
6) (-3, 3, 3)

3) (3, 2)

4) (-8, -7)

1) $6x - y = 14$
 $-6x + 2y = -10$

$\begin{bmatrix} 6 & -1 & | & 14 \\ -6 & 2 & | & -10 \end{bmatrix} \xrightarrow{R_1 + R_2} \begin{bmatrix} 6 & -1 & | & 14 \\ 0 & 1 & | & 4 \end{bmatrix} \xrightarrow{R_2 + R_1} \begin{bmatrix} 6 & 0 & | & 18 \\ 0 & 1 & | & 4 \end{bmatrix} \xrightarrow{\frac{1}{6} R_1} \begin{bmatrix} 1 & 0 & | & 3 \\ 0 & 1 & | & 4 \end{bmatrix}$

$(3, 4)$

$$\begin{aligned} -4x - 6y &= -8 \\ -8x - 12y &= -16 \end{aligned}$$

$$\begin{aligned} 2) \quad -6x + 8y &= 2 \\ 3x + 7y &= 10 \end{aligned}$$

$$\begin{aligned} & \begin{matrix} (1,1) \\ \frac{1}{2}R_1 \rightarrow R_1 \end{matrix} \quad \left[\begin{array}{cc|c} 1 & 0 & a \\ 0 & 1 & b \end{array} \right] \\ \left[\begin{array}{cc|c} -6 & 8 & 2 \\ 3 & 7 & 10 \end{array} \right] & \xrightarrow{\frac{1}{2}R_1 \rightarrow R_1} \left[\begin{array}{cc|c} -3 & 4 & 1 \\ 3 & 7 & 10 \end{array} \right] \\ \begin{matrix} R_1 + R_2 \\ \rightarrow R_2 \end{matrix} \left[\begin{array}{cc|c} -3 & 4 & 1 \\ 0 & 11 & 11 \end{array} \right] & \xrightarrow{\frac{1}{11}R_2 \rightarrow R_2} \left[\begin{array}{cc|c} -3 & 4 & 1 \\ 0 & 1 & 1 \end{array} \right] \\ \begin{matrix} R_2 + R_1 \\ \rightarrow R_1 \end{matrix} \left[\begin{array}{cc|c} -3 & 0 & -3 \\ 0 & 1 & 1 \end{array} \right] & \xrightarrow{\begin{matrix} -\frac{1}{3}R_1 \\ \rightarrow R_1 \end{matrix}} \left[\begin{array}{cc|c} 1 & 0 & 1 \\ 0 & 1 & 1 \end{array} \right] \end{aligned}$$

$$\begin{aligned} 3) \quad -2x + y &= -4 \\ 12x - 3y &= 30 \end{aligned}$$

$$\begin{aligned} \left[\begin{array}{cc|c} -2 & 1 & -4 \\ 12 & -3 & 30 \end{array} \right] & \xrightarrow{\begin{matrix} 6R_1 + R_2 \\ \rightarrow R_2 \end{matrix}} \left[\begin{array}{cc|c} -2 & 1 & -4 \\ 0 & 3 & 6 \end{array} \right] \xrightarrow{\begin{matrix} \frac{1}{3}R_2 \\ \rightarrow R_2 \end{matrix}} \\ \left[\begin{array}{cc|c} -2 & 1 & -4 \\ 0 & 1 & 2 \end{array} \right] & \xrightarrow{\begin{matrix} -R_2 + R_1 \\ \rightarrow R_1 \end{matrix}} \left[\begin{array}{cc|c} -2 & 0 & -6 \\ 0 & 1 & 2 \end{array} \right] \xrightarrow{\begin{matrix} -\frac{1}{2}R_1 \\ \rightarrow R_1 \end{matrix}} \\ \left[\begin{array}{cc|c} 1 & 0 & 3 \\ 0 & 1 & 2 \end{array} \right] & \quad \boxed{(3,2)} \end{aligned}$$

$$4) \begin{cases} -5y + 21 + 7x = 0 \\ -2x = -12 - 4y \end{cases}$$

Let's get it
matrix-ready

$$\begin{cases} 7x - 5y = -21 \\ -2x + 4y = -12 \end{cases}$$

$$\left[\begin{array}{cc|c} 7 & -5 & -21 \\ -2 & 4 & -12 \end{array} \right] \xrightarrow[-R_2]{-\frac{1}{2}R_2} \left[\begin{array}{cc|c} 7 & -5 & -21 \\ 1 & -2 & 6 \end{array} \right] \xrightarrow{R_1 \leftrightarrow R_2} \left[\begin{array}{cc|c} 1 & -2 & 6 \\ 7 & -5 & -21 \end{array} \right]$$

$$\xrightarrow[-R_2]{-7R_1 + R_2} \left[\begin{array}{cc|c} 1 & -2 & 6 \\ 0 & 9 & -63 \end{array} \right] \xrightarrow[-R_2]{\frac{1}{9}R_2} \left[\begin{array}{cc|c} 1 & -2 & 6 \\ 0 & 1 & -7 \end{array} \right] \xrightarrow[-R_1]{2R_2 + R_1} \left[\begin{array}{cc|c} 1 & 0 & -8 \\ 0 & 1 & -7 \end{array} \right]$$

$$\begin{cases} x = -8 \\ y = -7 \end{cases} \quad (-8, -7)$$

$$5) \begin{cases} -x - 2y + z = 2 \\ 4x + y - z = -4 \\ -x - 2y + 4z = 20 \end{cases}$$

$$\left[\begin{array}{ccc|c} -1 & -2 & 1 & 2 \\ 4 & 1 & -1 & -4 \\ -1 & -2 & 4 & 20 \end{array} \right] \xrightarrow[-R_1]{-R_1} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 4 & 1 & -1 & -4 \\ -1 & -2 & 4 & 20 \end{array} \right] \xrightarrow[-R_2]{-4R_1 + R_2} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & -7 & 3 & 4 \\ -1 & -2 & 4 & 20 \end{array} \right]$$

$$\xrightarrow[-R_3]{-R_1 + R_3} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & -7 & 3 & 4 \\ 0 & -4 & 5 & 22 \end{array} \right] \xrightarrow[-R_3]{-4R_2 + 7R_3} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & -7 & 3 & 4 \\ 0 & 0 & 23 & 138 \end{array} \right] \xrightarrow[-R_3]{\frac{1}{23}R_3} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & -7 & 3 & 4 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

$$\xrightarrow[-R_2]{-3R_3 + R_2} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & -7 & 0 & -14 \\ 0 & 0 & 1 & 6 \end{array} \right] \xrightarrow[-R_2]{-\frac{1}{7}R_2} \left[\begin{array}{ccc|c} 1 & 2 & -1 & -2 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

$$\xrightarrow[-R_1]{R_3 + R_1} \left[\begin{array}{ccc|c} 1 & 2 & 0 & 4 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 6 \end{array} \right] \xrightarrow[-R_2]{-2R_2 + R_1} \left[\begin{array}{ccc|c} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 6 \end{array} \right] \quad (0, 2, 6)$$

$$\begin{aligned} 6) \quad & -4x - 5z = -3 \\ & -5x - y - z = 9 \\ & -2x - 6y + z = -9 \end{aligned}$$

$$\begin{aligned} & \begin{bmatrix} -4 & 0 & -5 & -3 \\ -5 & -1 & -1 & 9 \\ -2 & -6 & 1 & -9 \end{bmatrix} \xrightarrow{R_1 \leftrightarrow R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ -5 & -1 & -1 & 9 \\ -4 & 0 & -5 & -3 \end{bmatrix} \xrightarrow{-2R_1 + R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ -5 & -1 & -1 & 9 \\ 0 & 12 & -7 & 15 \end{bmatrix} \\ & \xrightarrow{R_2 \leftrightarrow R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 12 & -7 & 15 \\ -5 & -1 & -1 & 9 \end{bmatrix} \xrightarrow{\frac{1}{7}R_2} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 4 & -1 & 9 \\ 0 & 12 & -7 & 15 \end{bmatrix} \\ & \xrightarrow{-3R_2 + R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 4 & -1 & 9 \\ 0 & 0 & -4 & -12 \end{bmatrix} \xrightarrow{-\frac{1}{4}R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 4 & -1 & 9 \\ 0 & 0 & 1 & 3 \end{bmatrix} \xrightarrow{R_2 + R_3} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 4 & 0 & 12 \\ 0 & 0 & 1 & 3 \end{bmatrix} \\ & \xrightarrow{\frac{1}{4}R_2} \begin{bmatrix} -2 & -6 & 1 & -9 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 3 \end{bmatrix} \xrightarrow{-R_3 + R_1} \begin{bmatrix} -2 & -6 & 0 & -12 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 3 \end{bmatrix} \\ & \xrightarrow{-\frac{1}{2}R_1} \begin{bmatrix} 1 & 3 & 0 & 6 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 3 \end{bmatrix} \xrightarrow{-3R_2 + R_1} \begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 3 \end{bmatrix} \xrightarrow{\leftrightarrow R_1} \boxed{(-3, 3, 3)} \end{aligned}$$

Quiz 1.1

Criterion D Real Life Application

https://www.youtube.com/watch?v=_L_vq5JYQIE



Grade	Percentage
A	87%
A-	75%
B+	71%
B	62%
B-	60%
C+	57%
C	50%
C-	45%
D+	38%
D	32%
D-	25%
F	0%

8 = 100%

7

6

5

4

3

2

1

(15%)

Quiz 1.1

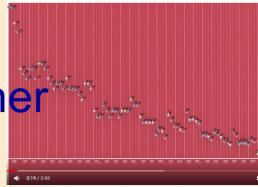
Criterion D Real Life Application

https://www.youtube.com/watch?v=_L_vq5JYQIE



Look over errors.
Learn from mistakes.
Improve on Unit Test.








Done?
Work on other
homework



Exercises...

Make quiz corrections
(Exemplar Online)

SOUTHWEST HIGH SCHOOL HOME MYP ENGLISH MYP AP GEOGRAPHY MYP MATH

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 Extended Level: Matrices Day 2 (9-26).pdf Download File	 Standard Level: Elimination (9-26).pdf Download File
 Standard and Extended Unit 1: Quiz 1 Exemplars (9-27) Download File	