

Name: _____ Per: _____ Date: _____
 Serafino ▪ Precalculus S2

7R

Matrix Operations: $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} -2 & 3 & 1 \\ 4 & -5 & 0 \end{bmatrix}$ $C = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ $D = \begin{bmatrix} 2 & 0 \\ 4 & -1 \\ 6 & 3 \end{bmatrix}$

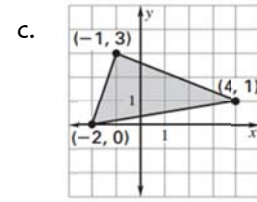
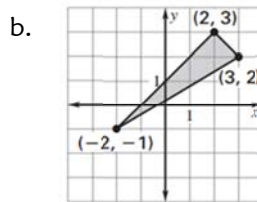
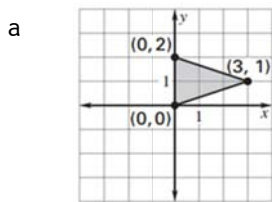
1. Perform the operations without a calculator:

a. $3A - 2B$ b. C^3 c. $2A - (B + D^T)$ d. DB

e. C^{-1} f. $|BD| - |C|$ g. Solve for Matrix X: $B - 2X = A$

2. Perform the operation with a calculator: $E = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & 1 \\ -6 & -2 & 4 \end{bmatrix}$ a. $|E|$ b. E^{-1}

3. Find the area of Triangles: a) Set up the Matrix Determinant formula b) Calculate the area with a calculator



Solving Systems with Cramer's Rule: a) Set up the system b) Set up the Cramer's Rule b) Do the math with a calc.
 4. On the quiz, you will only be asked to use Cramer's rule to solve for ONE variable. So, for the problems below, you're going to a) pick a variable to solve for b) SET UP Cramer's rule for that variable c) Use your calc to solve. □ Some systems may need some rearranging...

a. $-5x - 5y = 25$
 $-2x - 4y = 16$

b. $x - 3y = 5$
 $-3x + 6y = 8$

c. $-4x - 6z = -12$
 $-6x - 4y - 2z = 6$
 $-x + 2y + z = 9$

d. $-6x - y + z = -7$
 $4z = -6$
 $4x - 24y + 24z = 17$

e. $3a + b = -c + 7$
 $a + 3b - c = 13$
 $b = 2a - 1$

f. $13 = 3x - y$
 $14y - 3x + 2z = -3$
 $z = 2x - 4y$

Applications of Matrix Multiplication & Solving with RREF:

5. The School Play: The play is running for three nights: Opening night (Thursday), the Second night (Friday) and the Final night (Saturday). People placed online orders for tickets in the following quantities, which can be represented in the Sales table to the right:

<i>Performance</i>	<i>Adults</i>	<i>Students</i>
Opening night	420	300
Second night	400	450
Final night	510	475

- a) Write the Sales Matrix S . Write another Sales Matrix, S^T (Label rows/columns to help you)
- b) What cell in matrix S represents the least number of students going?
Why could that be?
- c) What cell in matrix S represents the least number of adults going?
Why could that be?
- d) Student tickets are \$5 and adult tickets are \$10, write a matrix, C , that represents the cost of each type of ticket. Note: You could write FOUR different types of matrices.

Does the order of adults vs. students matter?

- e) Multiply two matrices to find how much money was taken in each night.

What is the total revenue?

- f) Ugh! The theater department wants to be able to buy an Audrey II for Little Shop of Horrors next year, and to do so, it actually need \$20,000 total revenue from the play. They decide to keep it open for a 4th night, at a far cheaper price so they can make it to their goal. Adult tickets will still be twice as much as student tickets. The sales for the 4th night are exactly like the second night. Set up and solve a matrix equation that shows how much should the theater department charge for each type of ticket to hit their target revenue?

6. Ba-da-bababa:

I'm buying McDonalds for all my Precalc classes.
These are their orders:

Orders:	Per 1	Per 3	Per 5
Big Macs	6	8	4
Wraps	5	3	10
Salads	2	6	4
McNuggets	2	4	3
Fries	2	3	2

a) Turn the table into Matrix O, the Order Matrix. Also, write O^T .

b) I look it up online, and see: A 20-pc Nuggets box is \$5, Salad is \$4.79, Big Mac is \$3.99, a Wrap is \$1.69 and a large Fries is \$1.79. Pick one of your Matrix O's and write Matrix P, a Price matrix, so that when you multiply them, you can see how much this lunch going to cost me, per class period. Label rows and columns to make life easy.

c) Matrix C (right) represents how many TOTAL calories each class consumed by eating Big Macs, McNuggets and Salads. Define your variables and set up a linear system and use RREF to solve for how many calories, each item.

	Total Calories
Per 1	5,302
Per 3	9,316
Per 5	5,908

d) How many calories are in each individual nugget?

