Pre-Calculus

Matrix Guided Notes

I am ___________________________________

Today is____________________in__________

Mr. Stalter is moonlighting selling cars at Bob Lindsay Honda. He is only comfortable selling Honda Pilots, Civics and Fits so far. His main competition there is, surprisingly, Mr. Elliott. Weirdly enough he also only sells Pilots, Civics and Fits. In December, Mr. Stalter sold $86,150 in Pilots, $34,750 in Civics, and $54,890 in Fits. Also, in December Mr. Elliott sold $48,670, $64,530, and $38,780 in Pilots, Civics, and Fits respectively. Find the following…….

Find the difference between Mr. Stalter's sales and Mr. Elliott sales for each respective model.

What was the total sales that Mr. Stalter and Mr. Elliott sold for Bob Lindsay Honda?

If Mr. Stalter and Mr. Elliott make 3.2% commission on their sales, who made more? How much more?

Using Matrices(plural for Matrix) to help………

Mr. Stalter Matrix

[ ]

Mr. Elliott Matrix

[ ]

Difference in Sales

Total Sales

Commission

Matrix Addition/Subtraction/Multiplying by Scalar

(An *m*x*n* matrix has m rows and n columns, elements(entries) of the matrix are given using the row,column location)

A = $\begin{bmatrix} 3 & 11 \\ -4 & 9 \end{bmatrix}$ B = $\begin{bmatrix} 10 & 8 \\ 0 & -3 \end{bmatrix}$ C = $\begin{bmatrix} 2 & -8 \\ 4 & -8 \end{bmatrix}$ D = $\begin{bmatrix} 2 & 3 & 5 \\ 1 & -2 & 7 \end{bmatrix}$

Find the following.

A + B

$A_{2,1}$

C + A

$D_{2,3}$

B – C

$C_{1,2}$

D + B

4C

-1.2D

-.4A

Multiplying Matrices

In order to multiply matrices, we must have columns of the first matrix be equal to rows of the second. Our resulting matrix will have the dimensions given by the rows of our first matrix and the columns of the second.

We multiply corresponding row(of the first matrix) and column(second matrix) entries and add the products.

Determine the dimensions of each matrix product.

1. $A_{2x3} \bullet B_{3x5}$ 2. $G_{4x7} \bullet C_{7x1}$ 3. $M_{2x2} \bullet N_{3x2}$

Multiply the following matrices, if possible.

4. $\begin{bmatrix} 2 & 3 \\ 4 & 7 \end{bmatrix} \bullet \begin{bmatrix} 6 & -8 \\ 12 & -5 \end{bmatrix}$ 5. $\begin{bmatrix} 13 \\ 5 \\ 8 \end{bmatrix} \bullet \begin{bmatrix} 6 & \frac{2}{10} & \frac{11}{4} \end{bmatrix}$ 6. $\begin{bmatrix} 9 & 8 \\ 4 & 3 \\ 5 & 6 \end{bmatrix} \bullet \begin{bmatrix} -10 & -2 \\ -3 & -4 \end{bmatrix}$

7. $\begin{bmatrix} -5 & 12 \\ 8 & -3 \\ -9 & -6 \end{bmatrix} \bullet \begin{bmatrix} 3 & -2 \\ -5 & 1 \\ 4 & 3 \end{bmatrix}$ 8. $\begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} \bullet \begin{bmatrix} 2 & -6 & 10 \\ 4 & -8 & 12 \end{bmatrix}$

Solve the following matrix multiplication word problems.

9. On two days, a store sold the following amounts of pencils, erasers, and binders.

	Pencils	Erasers	Binders
Monday	48	7	9
Tuesday	54	10	6

If the price for each pencil, eraser, and binder, respectively, is \$0.20, \$0.35, and \$2.85, how much was made each day?

10.

Menu Items

Location	**Soft Pretzels**	**Cotton Candy**	**Popcorn**	**Hot Dogs**
Great America	150	117	410	490
Key Lime Cove	237	160	215	275
Wilderness Lodge	160	0	178	188

	Soft Pretzels	**Cotton Candy**	**Popcorn**	**Hot Dogs**
Income	6.50	5	5.50	6.95

Write matrix A so that it represents the location/production table.

Write matrix B so that it represents the "income by menu item" table and so that it can be multiplied by matrix A.

Calculate the total income for these menu items at each amusement park.

Find the total income for these menu items for all 3 amusement parks.

11. In a three team track meet, the following numbers of 1^{st}, 2^{nd}, and 3^{rd} place finishes were recorded.

School	**First Place**	**Second Place**	**Third Place**
Lee	4	10	6
Central	7	6	9
Clarke	8	3	4

If 5 points are awarded for 1^{st}, 3 points for 2^{nd}, and 1 point for 3^{rd}, determine who won the track meet.

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