**Matrices EOC Review**

If two matrices have the same dimensions (rows and columns, i.e. 3x4 and 3x4), you can add or subtract them. To do this, add or subtract corresponding elements of the two matrices.

You can multiply two matrices ***if and only if*** the number of *columns* in the first matrix is equal to the number of *rows* in the second. (i.e. a 3x4 and a 4x4, but not a 3x4 and a 3x4)

\*\*You can plug these in to the matrix menu in your calculator and perform any operation from there.\*\*

Matrix multiplication can be used with application problems too!

**Example:** In a four-team track meet, 5 points were awarded for each first-place finish, 3 points for each second, and 1 point for each third. Find the total number of points for each school. Which school won the meet?



**Determinants:**

Every square matrix has a number associated with it called its determinant. A determinant is a square array of numbers of variables enclosed between two parallel lines. (So instead of brackets, you have absolute value bars)

*To find in your calculator:*

* Open the Matrix menu 2nd🡪x-1
* Go to EDIT and input the square matrix
* Exit the matrix menu
* Open the matrix menu again, 🡪Math🡪1 det
* Select the matrix where you put your data and hit enter to calculate.

\*\*Remember this will only work with a square matrix (number of rows and columns must be the same!) $\left|\begin{matrix}-2&5\\6&8\end{matrix}\right|$ $\left|\begin{matrix}2&7&-3\\-1&5&-4\\6&9&0\end{matrix}\right|$

**Identity and Inverse Matrices:** $ \left[\begin{array}{c}1    0\\0    1\end{array}\right]$ $\left[\begin{array}{c}1  0  0\\0  1  0\\0  0  1\end{array}\right]$

*Identity matrix:* a square matrix with 1st for every element of the main diagonal and zeros everywhere else.

In real numbers, two numbers are inverses if their product is the identity, 1. The same is true for matrices, when you multiply by the identity matrix by another matrix, you should end up with the same matrix.

*Inverse matrices:* Two matrices are inverses of each other if their product is the identity matrix.

*To find in your calculator:*

* Edit the matrix to input your data, then quit the matrix menu
* Open the matrix menu and select the matrix you used for your data.
* Then hit the x-1 button and enter.

Determine whether the pair of matrices are inverses.

P = $\left[\begin{array}{c}3 4\\1 2\end{array}\right]$ Q = $\left[\begin{array}{c}1 -2\\\frac{-1}{2}   \frac{3}{2}\end{array}\right]$

Find the inverse of the matrix.

R = $\left[\begin{array}{c}-4  -3\\  8        6 \end{array}\right]$