To Add 2 Matrices, they must be exactly of the same dimension: equal number of rows and equal number of columns.

$$\begin{bmatrix} 2 & -1 & 3 \\ 8 & -6 & 4 \\ 0 & 1 & 5 \\ 7 & -7 & 9 \end{bmatrix} + \begin{bmatrix} 3 & -5 & 4 \\ 1 & 0 & 3 \\ -3 & -5 & -3 \\ -7 & 9 & -4 \end{bmatrix} = \begin{bmatrix} 5 & -6 & 7 \\ 9 & -6 & 7 \\ -3 & -4 & 2 \\ 0 & 2 & 5 \end{bmatrix}$$

To Multiply 2 Matrices, the number of columns of the 1^{st} must equal the number of rows of the 2^{nd} and the result has the number of rows of the 1^{st} and the numbers of columns of the 2^{nd} .

$$\begin{bmatrix} 1 & 0 & 3 \\ 2 & -1 & -2 \end{bmatrix} * \begin{bmatrix} -2 & 4 & 2 \\ 1 & 0 & 0 \\ -1 & 1 & -1 \end{bmatrix} = \begin{bmatrix} -5 & 7 & -1 \\ -3 & 6 & 6 \end{bmatrix}$$

Only Square Matrices have Determinants. If A is a Square Matrix, the **Minor** M_{ij} of the entry a_{ij} is the determinant of the matrix obtained by deleting the i^{th} row and the j^{th} column of A.

The **Cofactor** C_{ij} of the entry a_{ij} is given by $C_{ij} = (-1)^{i+j}M_{ij}$

$$A = \begin{bmatrix} 0 & 2 & 1 \\ 3 & -1 & 2 \\ 4 & 0 & 1 \end{bmatrix} \text{ The Minor of -1 is } \begin{vmatrix} 0 & 1 \\ 4 & 1 \end{vmatrix} = 0 - 4 = -3$$

To find the Determinant of a square matrix, pick a row or a column and multiply each element by its Cofactor and add the results.

$$\text{The determinant of } \begin{bmatrix} 0 & 2 & 1 \\ 3 & -1 & 2 \\ 4 & 0 & 1 \end{bmatrix} = \begin{vmatrix} 0 & 2 & 1 \\ 3 & -1 & 2 \\ 4 & 0 & 1 \end{vmatrix} = -3\begin{vmatrix} 2 & 1 \\ 0 & 1 \end{vmatrix} - \begin{vmatrix} 0 & 1 \\ 4 & 1 \end{vmatrix} - 2\begin{vmatrix} 0 & 2 \\ 4 & 0 \end{vmatrix}$$

$= -3(2) – (-4) – 2(-8) = -6 + 4 + 16 = 14$

Pre-Calculus 2 Assignment 217 Thursday, March 12, 2015 Hour Name

1. Find the Determinant of $\begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 0 \\ 3 & 0 & 2 \end{bmatrix}$

2. Multiply: $\begin{bmatrix} 2 & 3 & -1 \\ 1 & 3 & 2 \end{bmatrix} * \begin{bmatrix} 3 & 4 \\ -2 & 2 \\ 1 & -1 \end{bmatrix} =$

3. $\begin{bmatrix} 3 & -5 \\ 4 & 1 \end{bmatrix} - \begin{bmatrix} 4 & 3 \\ 5 & -2 \end{bmatrix} =$

4. $\begin{bmatrix} 2 & 8 \\ 3 & 7 \end{bmatrix} * 2\begin{bmatrix} 4 \\ 1 \end{bmatrix} =$