

## 2.4

## Quick Notes

### Matrices

A matrix is a rectangular array of numbers, like the following examples

$$A = \begin{bmatrix} 5 & 6 & 1 \\ 4 & 8 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 11 & 2 \\ 3 & 7 \\ 9 & 13 \end{bmatrix} \quad C = \begin{bmatrix} 7 & 3 & 2 \\ 0 & 4 & 1 \end{bmatrix}$$

Dimensions of a matrix – A matrix has dimensions  $m \times n$ , where  $m$  is the number of rows and  $n$  is the number of columns. Matrix A has dimensions  $2 \times 3$  because it has 2 rows and 3 columns. Similarly, matrix B has dimensions  $3 \times 2$  because it has 3 rows and 2 columns.

Entries – To refer to one of the entries in matrix A, we use the symbol  $a_{mn}$  which represents the entry in the  $m^{\text{th}}$  row and the  $n^{\text{th}}$  column. For example,  $a_{12}$  is 6 (first row, second column), and  $a_{23}$  is 0 (second row, third column).

If a matrix has the same number of rows as it does columns, then it is a square matrix.

Two matrices are equal ( $A = B$ ) if and only if they have the same dimensions and all corresponding entries are equal.

Scalar multiplication – If we want to calculate  $3A$ , we simply multiply each entry in A by 3. (Show on board)

Addition / Subtraction – In order to add or subtract matrices, they must have the same dimensions. If they do, to add/subtract we simply add/subtract the corresponding entries (keep it in order for subtraction)

Ex) Calculate the following if possible.      a) Find  $A + C$       b) Find  $A + B$       c) Find  $3C - 2A$

d) Find the missing variables.  $3 \begin{bmatrix} 1 & 3 & x \\ 2 & -4 & 0 \end{bmatrix} - 4 \begin{bmatrix} y & -2 & 1 \\ 4 & z & 3 \end{bmatrix} = \begin{bmatrix} 7 & 17 & 6 \\ -10 & 0 & -12 \end{bmatrix}$

**(In class – show how to enter matrices into Ti – 83 or similar calculator)**