Handout: Matrices in the Calculator (TI-83/84)

Section I. Using Your Graphing Calculator to Work with Matrices

1. To enter a Matrix into a TI-83/84 calculator, follow these steps:
    a. Press **[2nd] [X-1]** to enter the Matrix Menu
    b. Tab over to **EDIT**
    c. Choose a letter (name) for the Matrix and press **[ENTER]**
    d. Enter the dimensions of the matrix you want to enter (pressing enter after each number)
    e. Enter the value of each entry as you move across the rows (pressing enter after each number)
    f. Press **[2nd] [MODE]** to quit to the main menu

    Repeat the process if you want to enter another matrix.

2. To perform an operation with matrices, follow these steps
    a. Press **[2nd] [X-1]** to enter the Matrix Menu
    b. While "**NAMES**" is highlighted, press the number of the matrix you wish to use first. This will place the matrix on the home screen.
    c. Choose your operation (+/-/x, etc.) just like you would with numbers
    d. Repeat steps (a) and (b) to choose another matrix
    e. Press **[ENTER]** to perform the operation.

Now, try these and see if you get the correct answers.

Enter all of these matrices into your calculator using their name.

$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ $B = \begin{bmatrix} -3 & 2 & 5 \\ 1 & 2 & 7 \end{bmatrix}$ $C = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$ $D = \begin{bmatrix} 2 & 3 \\ -1 & 5 \end{bmatrix}$ $E = \begin{bmatrix} 1 & 3 & 5 \\ 2 & 1 & 0 \\ -1 & 5 & 2 \end{bmatrix}$

1. A + B

2. C - D

3. 2A

4. CD

5. AD

6. 3C – 5D

The answers you should get will be displayed on the screen.

3. To find the determinant of a matrix, follow these steps
    a. Press **[2nd] [X-1]** to enter the Matrix Menu
    b. Tab over to the **MATH** menu
    c. Press **[1]** *det(*
    d. Press **[2nd] [X-1]** to enter the Matrix Menu
    e. While "**NAMES**" is highlighted, press the number of the matrix you wish to use.
    f. Press **[ENTER]** to find the determinant.

4. To find the inverse of a matrix, follow these steps
    a. Press **[2nd] [X-1]** to enter the Matrix Menu
    b. While "**NAMES**" is highlighted, press the number of the matrix you wish to use.
    c. Once the matrix shows on the home screen, press the **[X-1]** button (without pressing [2nd])
    d. Press **[ENTER]** to find the inverse.
    e. To find the exact value of the inverse (in fraction form), now press **[MATH][1]** *>Frac*.
    f. Press **[Enter]** to have the entries written in fraction form.
    g.

Section II. Use Your Calculator to Find the Product of Each of the Following.

1. A^{-1}

2. C^{-1}

3. det[B]

4. det[D]

5. det[E]

6. E^{-1}

7. $C^{-1}D$

8. $D^{-1}D$

Assignment: Assignment #9 – Working with Matrices in the Calculator