We will enter the following matrix into the graphing calculator. $\begin{bmatrix} 1 & -3 \\ 2 & 1 \end{bmatrix}$

1. To enter a matrix, use the following keystrokes.
        2nd, x^{-1} (MATRIX), > (MATH), > (EDIT), 1 (A)
    Enter the dimensions of the matrix.
            2, Enter, 2, Enter   (Use the Enter key to move between fields.)
    Now enter the elements of the matrix.
            1, Enter, -3, Enter, 2, Enter, 1,
    Now the matrix is stored in the calculator.

2. Now, solve the following system of equations using matrices. $\begin{aligned} x - 3y &= 5 \\ 2x + y &= 1 \end{aligned}$

    To solve this system, use an <u>augmented matrix</u>, which is a matrix that contains the coefficient matrix with an extra column containing the constant terms. The augmented matrix for the system above is $\begin{bmatrix} 1 & -3 & 5 \\ 2 & 1 & 1 \end{bmatrix}$. The first two columns are the coefficient matrix and the last column is the constant matrix.

    Enter the augmented matrix using the keystrokes from part 1.

    The <u>reduced row echelon</u> function of the graphing calculator reduces the augmented matrix so that the solution of the system of equations can be easily determined.

    To use the reduced row echelon form to solve the system, use the following keystrokes.
            2nd, x^{-1} (MATRIX), > (MATH), Alpha (green key), Apps (B), 2nd, x^{-1} (MATRIX), 1 (A), Enter

    The following matrix should appear on your screen.
            $\begin{bmatrix} 1 & 0 & 1.1428571... \\ 0 & 1 & -1.285714... \end{bmatrix}$
    The first two columns of the matrix are the elements of the identity matrix. The last column contains the solution, X is on top and Y is on bottom. The solution to the system is $(1.14, -1.29)$.