Objective: To be able to solve a system of equations using the TI-83/84.

To solve the following system of equations:

\[
\begin{align*}
5x + 2y &= 20 \\
x - y &= -3
\end{align*}
\]

Steps:

1) Rewrite the system of equations into a matrix equation.
   Recall the matrix equation is \([A] \cdot [X] = [B]\)

\[
\begin{bmatrix}
5 & 2 \\
1 & -1
\end{bmatrix}
\begin{bmatrix}
X \\
Y
\end{bmatrix}
= 
\begin{bmatrix}
20 \\
-3
\end{bmatrix}
\]

2) Enter the elements of \([A]\).
   Press [MATRX] key. Use right arrow key, to move to the edit mode by pressing it twice. Press \(\text{ENTER}\) to bring up \([A]\) and change its dimensions if necessary. Press \(\text{ENTER}\) after each number entered. Enter all elements of \([A]\). Now press \(\text{2nd}\) and then \([\text{QUIT}]\) (above \(\text{MODE}\)). This will exit edit mode.

3) Enter the elements of \([B]\).
   Follow the steps as for \([A]\) but \([B]\) instead.

4) Press \(\text{2nd}\) then \([\text{QUIT}]\) (above \(\text{MODE}\)). This will exit edit mode.

**Remember the solution of this system can be found by using:**

\([X] = [A]^{-1} \cdot [B]\)

5) Using a clear display, we need to find \([A]^{-1}\). Press [MATRX] key and then press \(\text{ENTER}\). The symbol for the matrix is displayed. Next press \(x^{-1}\) key to now show the symbol for the inverse of the matrix.

6) Press the multiplication key.

7) Now display the second matrix by pressing [MATRX], down to option 2 and then press \(\text{ENTER}\).

8) Press \(\text{ENTER}\) and the solution is displayed. The point of intersection is \((2, 5)\).

**Note:** If an error occurs recheck the values entered for matrices \([A]\) and \([B]\). If error still exists, remember not all systems of equations have a unique solution. Find these solutions by solving each equation for \(y\) and check he graphs of that system.