Tables and Limits

The goal of this worksheet is to understand the <u>TABLE</u> and <u>TBLSET</u> buttons and use these commands to understand the concept of the limit of a function.

Let's start by investigating the function $y = \dfrac{x^2 - 4}{x - 2}$. Input this function into the <u>Y=</u> menu. [*Don't forget your parentheses!*]

Now we will call up a table of the entries of this function. Hit <u>TABLE</u>, which you do by typing <u>2ND</u> then <u>GRAPH</u>.

You now see a table of values, with an error at $x = 2$. By your skills of deduction, it appears that $y(2)$ should be _____.

But let's get closer to $x = 2$ to get a better idea about if your guess is correct. To change the table settings, hit <u>TBLSET</u>, which you do by typing <u>2ND</u> then <u>WINDOW</u>. The two important pieces of information are

- TblStart = the starting x value for the table.

- ΔTbl = the change in the x values for the table.

Initially, x-values start at 0 and the change in successive terms is 1. What is a good value for these two quantities if you want to zoom in to values closer to $x = 2$?

- TblStart =

- ΔTbl =

TRY IT OUT: Enter those values into the <u>TBLSET</u> menu and then press <u>TABLE</u>. With an x-value highlighted, press the $\uparrow$ and $\downarrow$ keys. This will let you scroll the x-values, which can be useful if you do not see $x = 2$ s a choice.

Now, find the limit of $\dfrac{x^2 - 5x + 4}{-x^2 + 3x - 2}$ as $x \to 1$.
[*Careful: an easy-to-make error is to input* $-$ *instead of* $^-$. *The* $-$ *sign is used* **only** *when subtracting and the* $^-$ *sign is used* **only** *when negating a number.*]

Also, find the limit of $\dfrac{\sqrt{x} - 2}{x - 4}$ as x approaches 4.