

## Tables and Limits

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

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

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

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 TBLSET, which you do by typing 2ND then WINDOW. The two important pieces of information are

- TblStart = the starting  $x$  value for the table.
- $\Delta$ Tbl = 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 =
- $\Delta$ Tbl =

TRY IT OUT: Enter those values into the TBLSET menu and then press TABLE. With an  $x$ -value highlighted, press the ↑ and ↓ keys. This will let you scroll the  $x$ -values, which can be useful if you do not see  $x = 2$  as a choice.

Now, find the limit of  $\frac{x^2 - 5x + 4}{-x^2 + 3x - 2}$  as  $x \rightarrow 1$ .

[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  $\frac{\sqrt{x} - 2}{x - 4}$  as  $x$  approaches 4.