Calculus I Calculations on the TI-83/84

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This instruction sheet contains the types of calculations used in most Calculus I courses. For instructions on how to do some of these computations with the graph of a function, refer to the sheet *Calculations with Graphs* on the web site above.
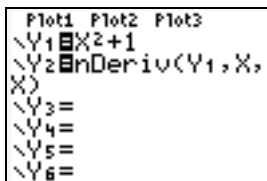
The Calculus commands can be found by pressing $\boxed{\text{MATH}}$. Below is a list of the commands that can be found under the [MATH] heading and how they are entered. It is important to note that all of the calculus computations on the TI-83/84 are done numerically and not algebraically. This simply means that when the calculator calculates a derivative, it is not finding the derivative like you do in your calculus class. The Calculator can tell you that for $f(x) = x^2 + 1$, $f'(2) = 4$, but it can't tell you that $f'(x) = 2x$.

6:fMin and **7:fMax**: Will find the Minimum or Maximum of a function over an interval. The form of the entry is fMin(f(x), x, lower limit, upper limit) or fMax(f(x), x, lower limit, upper limit) where the upper and lower limit are values on the left and right of the maximum of minimum. You may wish to examine the graph to find suitable upper and lower limits.

8:nDeriv: Will evaluate the first derivative at any point. The form of the entry to evaluate $f'(a)$ is nDeriv(f(x), x, a). For example, if $f(x) = x^2 + 1$ then to use the calculator to evaluate $f'(2)$, enter `nDeriv(x²+1,x,2)` and press $\boxed{\text{ENTER}}$ to get 4.
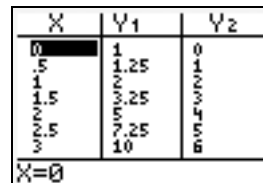
9:fnInt: Will evaluate a definite integral. The form of the entry to evaluate $\int_a^b f(x)\,dx$ is fnInt(f(x), x, a, b). For example, to evaluate $\int_0^3 x^2 + 1\,dx$ enter `fnInt(x²+1,x,0,3)` and press $\boxed{\text{ENTER}}$ to get 12.

Tables: The Table will evaluate the y-coordinate of every function in the Y= editor. For example, enter $f(x) = x^2 + 1$ as Y_1, and press $\boxed{\text{2nd}}$ [TBLST]. If Indpnt is set at ASK you will enter the x values by hand, if Indpnt is set at AUTO then the calculator will create a list of x values starting at the TblStart value and increasing by Δ Tbl. *Screen 1* shows how to enter the function $f(x) = x^2 + 1$ and its derivative. *Screen 2* shows the values of $f(x)$ and its derivative for the values starting at x = 0 and increasing 0.5 each time.

screen 1

screen 2

Notes
The function in any of these commands can be called from the Y = editor (where functions are entered for graphing). For example, if $f(x) = x^2 + 3x - 1$ is in the Y= editor as Y_1, then you can enter `nDeriv(Y₁,x,2)` to find $f'(2)$. To enter Y_1 press $\boxed{\text{VARS}}$, scroll right to [Y-VARS], select [1:Function...], and select the desired function.