TI–83 Labs For Mathematics 223

Introductory Analysis I

by

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TI–83 Lab 1 for Mathematics 223

Topics: evaluation of a function, finding roots (zeroes) of functions

Evaluation of a Function. We will evaluate the function, $f(x) = 3x^4 + 8x^3 - 90x^2 + 4$, at $x = -1, 0, 23$

1. Type the function $f(x) = 3x^4 + 8x^3 - 90x^2 + 4$ into "Y =". Then 2nd QUIT.
2. To evaluate this function at $x = -1$, type

   VAR Y–VAR ENTER ENTER (-1) ENTER

   The calculator should return -91.
3. In a similar way, the calculator should return 4 and 889253 for $x = 0$ and $x = 23$, respectively.

Zero of a Function. We will use the calculator to find a *zero* of the function, $y = 150 + 32x - 12x^2$. In other words, will we locate where this function crosses the x–axis (where $y = 0$).

- Set the various parameter values of the window of the TI–83 calculator as follows: Xmin = 0, Xmax = 6, Xscl = 1, Ymin = -50, Ymax = 250, Yscl = 25, Xres = 1.
- Next, we want type in the function. Push "Y =". Now type

  $-$ 150 $+$ 32 "X,T,θ,n" $-$ 12 "X,T,θ,n" x^2
- Next, we want to graph the function. Type GRAPH.
- To find a zero for this function, type "2nd TRACE" (or, in other words, CALC), then choose "2:zero", followed by ENTER.
  - In response to "Left Bound?", move the blinking box along the function down to close to a point just *above* the x–axis and then press ENTER.
  - In response to "Right Bound?", move the blinking box along the function down to close to a point just *below* the x–axis and then press ENTER.
  - In response to "Guess?", move the blinking box along the function to as close as possible to the point where the function crosses the x–axis and then press ENTER.
  - The calculator then returns the answer, $X = 5.111928$, when, of course, $Y = 0$.