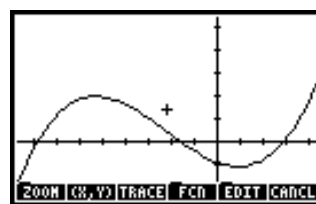
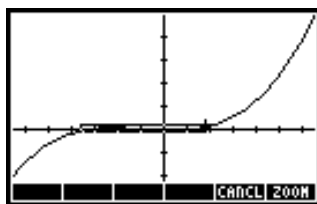
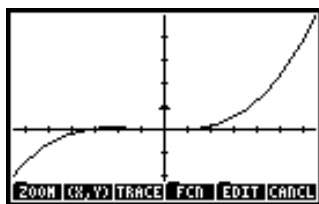


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Calculator Lesson 10

Finding Zeros and Extrema

In this lesson we learn how to find zeros and local extrema of a function. We will use the function $f(x) = 3x^3 + 8x^2 - 8x - 8$ as an example. Define this function as F(X). Go to 2D/3D and set EQ: to 'F(X)'. In WIN set the H-View to the default values and V-View to AUTO, then ERASE and DRAW. The vertical scale is so large that the "interesting" part of the graph looks like it is almost all zero. See the figure on the left below. Press F1-ZOOM and move the cursor



to a point just to the left of where the graph starts down below zero and one pixel below the x-axis. Now press F2-BOXZ and move the cursor to a point just to the right of where the graph goes positive and one pixel above the x-axis. The graph should now look like the figure in the center above. Press F6-ZOOM and your graph should look like the figure above on the right. We now have a graph with which we can work. We see that there are three zeros, one local maximum and one local minimum. To find one or more of these points of interest, press F4-FCN. To find a zero, move the cursor close to the desired x-intercept and press F1-ROOT. The zero will show at the bottom of the screen and will also be placed on the stack. Press NXT to get back the menu. To find one of the extrema, move the cursor close to the one you want and press F6-EXTR. The local extremum you were seeking will appear at the bottom of the screen and will also be placed on the stack.

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