

CHAPTER 8 Calculator Notes for the TI-83 and TI-83/84 Plus

Note 8A • Changing Mode

For your work in this chapter, check and change, if necessary, three settings on the Mode screen.

- Press **MODE** and set the third line to Degree. You will work with angles in the second half of the chapter and those angles are measured in degrees. If you get a “funny” answer when using a trigonometric function, check to see that you are still in Degree mode.
- Set the fourth line to Par. In this chapter you graph and use parametric equations. When you switch to Parametric mode, the Y= screen and the Window screen change.
- Set the sixth line to Simul. Often in this chapter you graph more than one set of parametric equations. In Simultaneous mode, all equations graph at the same time. In Sequential mode, equations graph one after the other.



Note 8B • Graphing in Parametric Mode

In Parametric mode, you define equations in terms of the parameter t . To enter the variable t , press **X,T,θ,n**.

It takes a pair of equations to create a single parametric graph. Until you define both X_{1T} and Y_{1T} (or any other X-Y pair) on the Y= screen, nothing will graph.

Setting the Window

In Parametric mode the Window screen is different from the familiar Function mode Window screen. The Graph screen that you see is still set by the values of Xmin, Xmax, Xscl, Ymin, Ymax, and Yscl. But in addition, you must set the starting and stopping values of t . The t -values you choose do not affect the dimensions of the Graph screen, but they do affect what will be drawn.

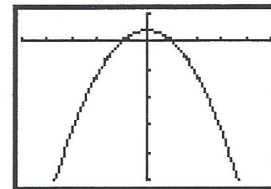
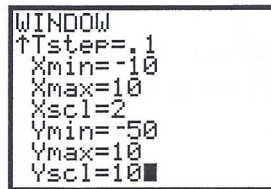
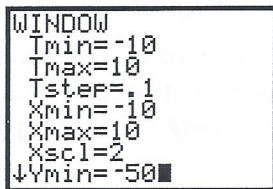
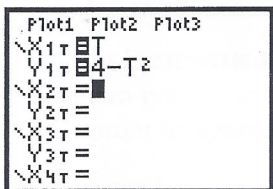
T_{min} = the minimum t -value that the calculator uses to evaluate the x - and y -function values.

T_{max} = the maximum t -value that the calculator uses to evaluate the x - and y -function values.

T_{step} = the increment by which t increases between each evaluation.

T_{step} controls the speed at which the graph is drawn. Start with T_{step} equal to about one hundredth of the range of t , $\frac{T_{max}-T_{min}}{100}$.

If the graphing speed is not to your liking or your graph needs more detail, adjust T_{step} .



(continued)

Setting the Graph Style

The graph styles are the same as those in Function mode except there is no shading in parametric equation graphs. See Note 3A for help with graph styles.

Note 8C • Tracing Parametric Equations

In Parametric mode, when you press **TRACE**, the spider starts at the point (x, y) defined by T_{min} . The t -, x -, and y -values are displayed.

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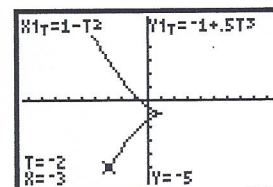
Plot1 Plot2 Plot3
X1T=1-T^2
Y1T=-1+.5T^3
X2T=
Y2T=
X3T=
Y3T=
X4T=
    
```

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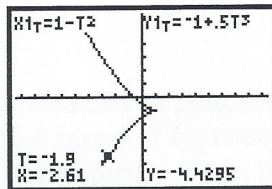
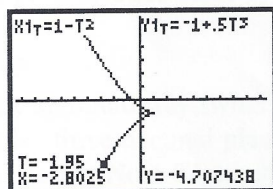
WINDOW
Tmin=-2
Tmax=2.5
Tstep=.05
Xmin=-9.4
Xmax=9.4
Xscl=1
Ymin=-6.2
Yscl=1
    
```

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WINDOW
Tstep=.05
Xmin=-9.4
Xmax=9.4
Xscl=1
Ymin=-6.2
Ymax=6.2
Yscl=1
    
```

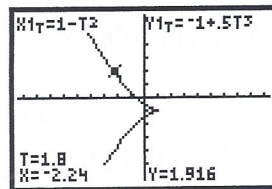
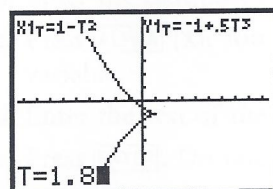


Each time you press the right arrow key, t increases by T_{step} and the spider moves to the new point defined by the new t -value. Note that the right arrow key may not necessarily move the spider to the right on the graph, but it will always increase the value of t . Pressing the left arrow key similarly decreases the value of t .



If more than one pair of equations is defined on the $Y=$ screen, pressing the up and down arrow keys makes the spider jump to the previous or next pair of equations. When the spider jumps to another pair of equations, the new pair is evaluated at the current t -value. The spider may be anywhere on the screen depending on the x -value and y -value for the new pair of equations.

Instead of using the right or left arrow keys to increase or decrease the t -value, you can enter a number. The spider jumps to the point defined by that t -value as long as the number is between T_{min} and T_{max} .



In Parametric mode there are no commands for finding the intersection of two graphs or the x - or y -intercepts of one graph. You'll need to trace in order to approximate points of intersection.