

Math 1592 - Calculus I

A brief Introduction to the TI92/Voyage 200

Here we give a selection of TI commands that we will be using through this course.

1. Basic Commands

solve

If we type the following

$$\text{solve}(x^2 - 1 = 0, x)$$

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then the TI will return

$$\text{solve}(x^2 - 1 = 0, x) \qquad x = 1 \text{ or } x = -1$$

$$\text{solve}(x^2 - 1 = 0, x)$$

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factor

If we type the following

$$\text{factor}(x^2 - 5 * x - 6)$$

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then the TI will return

$$\text{factor}(x^2 - 5 * x - 6) \qquad (x - 6) \cdot (x + 1)$$

$$\text{factor}(x^2 - 5 * x - 6)$$

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tExpand, tCollect

These are useful for expanding and simplifying trig functions. If we type the following

$$\text{tExpand}(\sin(2 * x))$$

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then the TI will return

$$\frac{tExpand(\sin(2 * x))}{tExpand(\sin(2 * x))} = 2 \sin(x) \cdot \cos(x)$$

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Similarly, if we type the following

$$tCollect(2 \sin(x) \cos(x))$$

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then the TI will return

$$\frac{tCollect(2 \sin(x) \cos(x))}{tCollect(2 \sin(x) \cos(x))} = \sin(2 \cdot x)$$

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Define

It is possible to define functions with the TI. If we type the following

$$Definef(\alpha) = \alpha^2$$

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then the TI will return

$$\frac{Definef(\alpha) = \alpha^2}{Definef(\alpha) = \alpha^2} \quad \text{Done}$$

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Then whenever we type $f(1)$ or $f(a)$ or $f(\text{anything})$ it will square it. To *unassign* it is necessary to go to **var-link**. It is found at 2nd –. Then scroll through the list, find your assigned entree , highlight it and then F1 and delete.

2. Graphing

The TI has a wonderful graphics package (well in 2D at least). If we type $\diamond W$ we get to the Y = which will let us enter our function. Scroll down (or up) to a place that is empty hit enter. This will put us at the base line. Then enter x^2 , *i.e.*

```
y1(x) = x^2
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```

and then hit enter again. This should put an x^2 by the $y1 =$ entry. Note the check mark \surd beside the $y1 = x^2$. This indicates the function has been chosen. If you wish to unchoose this function without completely eliminating it you can by unchecking it. Here we use the F4 button to do this. Now we are ready to graph. By choosing the $\diamond R$ we get graph key which put us into a new screen and the plots the graph of the function(s) we have chosen. We also have a lot of capabilities here. We can zoom (F2), trace (F3), regraph (F4) and perform mathematical calculations (F5). These are things that you can experiment with. If you wish to change the window (*the length of the x and y axis*) we can do this by choosing the window key. This is done by choosing $\diamond E$. Once there we will have

```
xmin=-3.
xmax=4.
xscl=1.
ymin=-5.
ymax=5.
yscl=1.
xres=2.
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```

3. Tables

Often times you wish to create a table of values and then maybe plot these. The TI also has this capability. We first must choose the **Data/Matrix** key. This then gives us a box

Data/Matrix Editor
1: Current
2: Open
3: New

we move the curser down until we get the new highlighted (or current if that is what you wish) and enter. Another box will appear that has the form

New	
Type:	Data →
Folder	pt2 →
Variable	<input style="width: 100%;" type="text"/>
(something faint here?)	<input style="width: 100%;" type="text"/>
(something faint here?)	<input style="width: 100%;" type="text"/>
Enter=OK	ESC=CANCEL

put some name on the variable name, say test, and then enter twice. You should then get a table that looks like

Data					
	c1	c2	c3	c4	c5
1					
2					
3					
4					
5					
6					

r1c1=

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Then go to the first space in the *c1* column and start entering the numbers you wish, say $-2, -1, 0, 1, 2,$ and 3 . Then use the curser to go to the *c2* cell and enter. This will put you at the base line and you can enter $c2 = f(c1)$ and then enter. The table should then fill itself *i.e.*

Data					
	c1	c2	c3	c4	c5
1	-2	4			
2	-1	1			
3	0	0			
4	1	1			
5	2	4			
6	3	9			

r1c1=

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If you are interested in plotting these plots, use the F2 key - plot setup. Here choose F1 - Define. You will have several options: For *Plot type*, choose scatter, for *Mark*, choose Box (or what ever symbol you wish). Then scroll to *x* and enter *c1* and then scroll to *y*

and enter $c2$. Then enter again and what you should get is a line that looks like

	F1	F2	F3	F4
	Define	copy	Clear	OK
√	Plot 1 : $\angle \rightsquigarrow \square x : c1 y : c2$			
	Plot 2 :			
	Plot 3 :			
	Plot 4 :			

If you wish to graph this, then type $\diamond R$ to graph. What you should see are your plotted points in addition to a solid line curve. To turn off the solid line curve choose $\diamond W$ to get $Y =$. You will see the $y1 = x^2$ which you can turn off. If you scroll up, you should also see

√ Plot 1 : $\angle \rightsquigarrow \square x : c1 y : c2$