Calculator Basics for the TI-89 Titanium & Voyage™ 200

To effectively use your TI-89 Titanium or Voyage™ 200 calculator in Calculus there are several things you will need to be familiar with. Settings will need to be found and changed. Some of the settings you will use frequently can be found as follows:

SETTING	TI-89 Titanium	Voyage™ 200
DARKEN/LIGHTEN DISPLAY	♦ **-/+ keys** **+** key darkens the display, **-** key lightens the display. These may be pressed repeatedly to obtain the darkness you wish.	♦ **-/+ keys** **+** key darkens the display, **-** key lightens the display. These may be pressed repeatedly to obtain the darkness you wish.
ENTRY LINE	The **active entry line** is at the bottom of the calculator screen. All typed entries appear here first. You can edit this line. When you press enter it will be placed in the history area above the line. **To clear the entry line press the CLEAR key.**	The **active entry line** is at the bottom of the calculator screen. What you type is put in here. You can edit this line. When you press enter it will be placed in the history area above the line. **To clear the entry line press the CLEAR key.**
HISTORY SCREEN	The **history screen** is the area above the entry line on your calculator. The default is set to retain the last 30 calculations you have made. You can **arrow up** to the history area, **highlight an entry**, and **press enter** to 'paste' a previous entry into the active entry line. **To clear the history area press F1 8.**	The **history screen** is the area above the entry line on your calculator. The default is set to retain the last 30 calculations you have made. You can **arrow up** to the history area, **highlight an entry**, and **press enter** to 'paste' a previous entry into the active entry line. **To clear the history area press F1 8.**
MODE OPTIONS	Press **MODE** There are a number of options hidden in three pages of **MODE** menus. They are accessed by pressing **F1, F2,** or **F3.**	Press **MODE** The Voyage 200 has three pages of **MODE** options**.** They are accessed by pressing **F1, F2,** or **F3.**
GRAPH	The **Graph** menu allows you to select from **Function, Parametric, Polar, Sequence, 3D or Differential Equation** graphs. (on **F1** page)	The Voyage 200 allows you to select from **Function, Parametric, Polar, Sequence, 3D or Differential Equation** graphs. (on **F1** page)

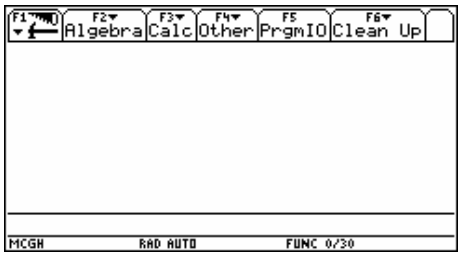
CURRENT FOLDER	The **TI-89 Titanium** allows you to create multiple folders to use for storage of user defined variables. The calculator comes with a built-in folder called **MAIN**. (on **F1** page)	The **Voyage 200** allow you to create multiple folders to use for storage of user defined variables. The calculators come with a built-in folder called **MAIN**. (on **F1** page)
DISPLAY DIGITS	Choose the number of digits displayed from 12 fixed or 13 floating point settings. (on **F1** page)	Choose the number of digits displayed from 12 fixed or 13 floating point settings. (on **F1** page)
ANGLE	Choose between **degrees** or **radians**. In calculus you usually want the calculator set in **Radians**. (on **F1** page)	Choose between **degrees** or **radians**. In calculus you usually want the calculator set in **Radians**. (on **F1** page)
EXPONENTIAL FORMAT	Allows you to choose between **Normal, Scientific** or **Engineering** formats. The **default is Normal**. (on **F1** page)	Allows you to choose between **Normal, Scientific** or **Engineering** formats. The **default is Normal**. (on **F1** page)
COMPLEX FORMAT	Allows you to choose between **Real** (does not display complex results), **Rectangular** (displays complex numbers in **a+bi** form), or **Polar** form (complex numbers are displayed in $re^{i\theta}$ form). (on **F1** page)	Allows you to choose between **Real** (does not display complex results), **Rectangular** (displays complex numbers in **a+bi** form), or **Polar** form (complex numbers are displayed in $re^{i\theta}$ form). (on **F1** page)
PRETTY PRINT	When **Pretty Print** is **on** the mathematics is displayed on the screen as you write it on paper. (on **F1** page)	When **Pretty Print** is **on** the mathematics is displayed on the screen as you write it on paper. (on **F1** page)
SPLIT SCREEN	Allows you to choose between a full screen or a split screen where you can have half history/text and half graphing or another application. (on **F2** page) When a **split screen is selected** other **MODE options** on page F2 become available. You can **designate which application appears** on which part of the split.	Allows you to choose between a full screen or a split screen where you can have part history/text and part graphing or another application. (on **F2** page) When a **split screen is selected** other **MODE options** on page F2 become available. You can **designate which application appears** on which part of the split as well as choosing between a **1:1, 1:2 or 2:1 split screen ratio**.
EXACT/ APPROXIMATE	Choose between **Automatic, Exact** or **Approximate** display of rational and symbolic expressions. Precision is increased in the exact setting by elimination of most rounding errors. (on **F2** page)	Choose between **Automatic, Exact** or **Approximate** display of rational and symbolic expressions. Precision is increased in the exact setting by elimination of most rounding errors. (on **F2** page)
APPS KEY	The **APPS** key allows you to access the Y= Editor, Window Editor, Text Editor, Program Editor, and others.	The **APPS** key allows you to access the Y= Editor, Window Editor, Text Editor, Program Editor, and others

ESC/ 2nd QUIT	One of these options will usually get you out of wherever you are that you don't want to be.	One of these options will usually get you out of wherever you are that you don't want to be.
GRAPHING EDITOR	♦**Y=** is the shortcut. This is where you enter the functions you wish to graph regardless of graph menu selected. **You can access the graphing format screen from here**.	♦**Y=** is the shortcut This is where you enter the functions you wish to graph regardless of graph menu selected. **You can access the graphing format screen from here**.
GRAPHING FORMAT SCREEN	♦**Y= F1 9** This screen allows you to select a coordinate system, axes style, grid, and labels in function mode. When in mode your selections are appropriate to the mode you are in.	♦**Y= F1 9** This screen allows you to select a coordinate system, axes style, grid, and labels in function mode. When in mode your selections are appropriate to the mode you are in.
GRAPHING STYLE	♦**Y= F6** This menu allows you to choose the style in which a curve will be graphed. Whether a graph is a solid or a dotted line is chosen here.	♦**Y= F6** This menu allows you to choose the style in which a curve will be graphed. Whether a graph is a solid or a dotted line is chosen here.
ZOOM OPTIONS	♦**Y= F2 ZOOM**	♦**Y= F2 ZOOM**
Zoom box	**1 ZoomBox** Useful to enlarge part of a graph for inspection. When 1 is pressed a cursor appears at the origin. Move it with the arrow keys to where you want a corner of a box. Press **ENTER** to anchor the one corner. Use the arrow keys to draw a box to the desired size and press **ENTER** to redraw the graph to the size of the specified box.	**1 ZoomBox** Useful to enlarge part of a graph for inspection. When 1 is pressed a cursor appears at the origin. Move it with the arrow keys to where you want a corner of a box. Press **ENTER** to anchor the one corner. Use the arrow keys to draw a box to the desired size and press **ENTER** to redraw the graph to the size of the specified box.
Zoom Standard	**6 ZoomStd** Returns the calculator to the standard viewing window.	**6 ZoomStd** Returns the calculator to the standard viewing window.
Zoom Trig	**7 ZoomTrig** Sets an approximate viewing window of $-3.29\pi \le x \le 3.29\pi$, $-4 \le y \le 4$, an xScl of $\frac{\pi}{2}$ and a yScl of 1.	**7 ZoomTrig** Sets an approximate viewing window of $-4.96\pi \le x \le 4.96\pi$, $-4 \le y \le 4$, an xScl of $\frac{\pi}{2}$ and a yScl of 1.
Zoom Fit	**A ZoomFit** Will give you a graph which usually includes the features you want to examine. It can be used to find a good graphing window for a function being examined.	**A ZoomFit** Will give you a graph which usually includes the features you want to examine. It can be used to find a good graphing window for a function being examined.

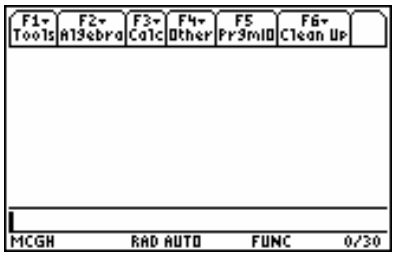
Zoom Decimal	**4 ZoomDec** The decimal setting allows the trace function to show x and y values every .1 unit. The default window is $-7.9 \le x \le 7.9$, $-3.8 \le y \le 3.8$	**4 ZoomDec** The decimal setting allows the trace function to show x and y values every .1 unit. The default window is $-11.9 \le x \le 11.9$, $-5.1 \le y \le 5.1$
Zoom Square	**5 Zoom Sqr** Redraws the graph so that the scales on the x- and y-axes are equally spaced for the viewer. This setting will make a circle look like a circle rather than an ellipse.	**5 Zoom Sqr** Redraws the graph so that the scales on the x- and y-axes are equally spaced for the viewer. This setting will make a circle look like a circle rather than an ellipse.
Zoom In	**2 ZoomIn** Allows you to magnify a portion of a graph centered at the cursor.	**2 ZoomIn** Allows you to magnify a portion of a graph centered at the cursor.
Zoom Out	**3 ZoomOut** Allows you to examine a larger portion of a graph centered at the cursor.	**3 ZoomOut** Allows you to examine a larger portion of a graph centered at the cursor.
GRAPHING WINDOW	**♦WINDOW** The standard default window **is** $-10 \le x \le 10$, $-10 \le y \le 10$. You can change it to whatever you need. **Xscl** and **Yscl** refer to the scales on the axes. You can change them to fit the problem. An **Xscl** or **Yscl** of 0 eliminates tic marks from the graph. The larger the **xRes** number is the rougher the graph will be. The default is 1.	**♦WINDOW** **The standard default window is** $-10 \le x \le 10$, $-10 \le y \le 10$ You can change it to whatever you need. **Xscl** and **Yscl** refer to the scales on the axes. You can change them to fit the problem. An **Xscl** or **Yscl** of 0 eliminates tic marks from the graph. The larger the **xRes** number is the rougher the graph will be. The default is 1.
♦≈	When calculator is set in **AUTO** mode pressing **♦≈** (**♦ ENTER**) will change an exact answer into an approximate answer.	When calculator is set in **AUTO** mode pressing **♦≈** (**♦ ENTER**) will change an exact answer into an approximate answer.
GRAPH MATH MENU	From a graph pressing **F5** gives you a menu from which you can choose to do things like evaluate the function at a point, find a function maximum or minimum, find a point of intersection, differentiate, integrate, find a point of inflection, find arc length, draw a tangent line to the function at a specified point.	From a graph pressing **F5** gives you a menu from which you can choose to do things like evaluate the function at a point, find a function maximum or minimum, find a point of intersection, differentiate, integrate, find a point of inflection, find arc length, draw a tangent line to the function at a specified point.
TRACE	Selecting **F3** from a graph will allow you to trace a function. While tracing if you type a number and press **ENTER** the calculator will interpret it as an **x-value** and will give you the corresponding **y-value** of the function.	Selecting **F3** from a graph will allow you to trace a function. While tracing if you type a number and press **ENTER** the calculator will interpret it as an **x-value** and will give you the corresponding **y-value** of the function

SELECTING TO GRAPH OR NOT TO GRAPH A FUNCTION	From the graph you can turn a function on or off for graphing by pressing **F4**. A function will graph only if it has a ✔ mark in front of it.	From the graph you can turn a function on or off for graphing by pressing **F4**. A function will graph only if it has a ✔ mark in front of it.
CATALOG	**CATALOG** If you can't find what you want in a pull down menu you can probably find it in the catalog. You can jump to a letter by typing the key that letter is above. **A very useful feature of the CATALOG is that the syntax for the command is given in the lower left hand corner of the calculator.** It is not given when a command is obtained from a pull down menu.	**2nd 2 (CATALOG)** If you can't find what you want in a pull down menu you can probably find it in the catalog. You can jump to a letter by typing the associated key. **A very useful feature of the CATALOG is that the syntax for the command is given in the lower left hand corner of the calculator.** It is not given when a command is obtained from a pull down menu.
2nd KEYS	The **2nd key** accesses whatever is above another key written in yellow.	The **2nd** keys access whatever is above another key written in yellow. There are **two 2nd keys** on the keyboard. **You can use either**.
ENTER	**ENTER** is used to execute a command.	**ENTER** is used to execute a command. There are **three ENTER keys** on the keyboard. **You can use whichever is most convenient.**
alpha key	The **alpha** key accesses the purple alphabet above the keys. ↑ **alpha** will give you an upper case letter, **alpha** will give you a lower case letter.	Not available. The qwerty keyboard makes this key unnecessary.
	The key accesses the green commands written above some keys.	The key accesses the green commands written above some keys
HIDDEN KEYBOARD	Press **EE** to access the hidden keyboard. The symbols shown here are accessible by typing followed by the key the desired symbol is above. These symbols are also available through pull down menus.	Press **K** to access the hidden keyboard. The symbols shown here are accessible by typing followed by the key the desired symbol is above. These symbols are also available through pull down menus.

Throughout these assignments the TI-89 Titanium calculator screens have been used. While the Voyage 200 screens differ slightly from that of the TI-89 Titanium, this difference is not significant enough to merit listing multiple calculator screens for use in doing these assignments. The screens for all calculators are shown below with the major differences noted.



Voyage™ 200



TI-89

The **TI-89** screen is configured like that of the **TI-92 Plus** but is not as wide.

The screen shown is called the home screen. When working with the **TI-89 Titanium** and **Voyage 200** the following areas of the home screen will be referred to. These areas are indicated below.