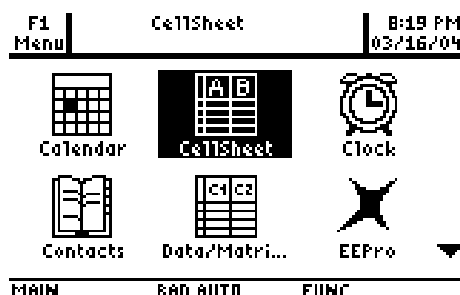# Getting Started with the TI-89 Titanium

The opening screen for TI-89 Titanium is similar to the following:

HOME

To access CAS, press the **HOME** button or select **Home** on the opening screen. (**APPS** returns you to the opening screen from all applications)

From the **HOME** screen, you can access the menus by pressing the **F1** to **F6** buttons. The **F6** menu can be accessed by the arrow keys or by pressing **2**nd **F1**
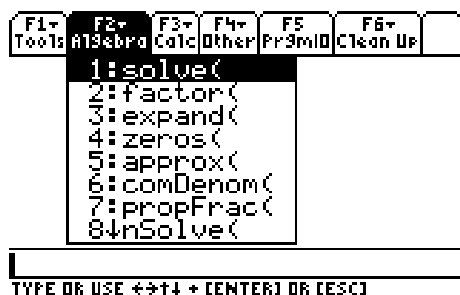
F1 Tools
This is similar to a conventional File or Edit menu on a computer program.
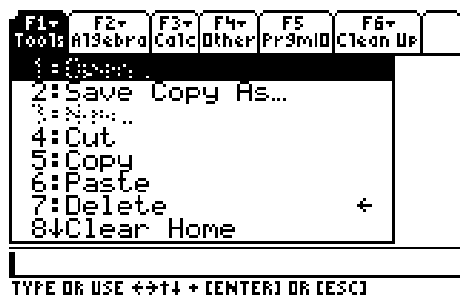
Option **8 Clear Home** is useful to clear the HOME screen of previously used expressions.

F2 Algebra
This has many of the CAS commands.

An example of each Algebra command is listed in the table below:

Example	Solution
solve(x^2–9=0,x)	x = -3 or x = 3
factor(x^2–16)	(x – 4) (x + 4)
expand(x*(x–5))	$x^2 – 5 \cdot x$
zeroes(x^2–5x+6,x)	(2 3)
approx(π)	3.14159
comDenom(x^2/2+x/5)	$\dfrac{5 \cdot x^2 + 2 \cdot x}{10}$
propFrac((5x^2+2x)/10)	$\dfrac{x^2}{2} + \dfrac{x}{5}$
nSolve(3x–5=0,x)	1.66667
Trig tExpand(sin(2x)) tCollect(2cos(x)^2–1)	 2·sin(x)·cos(x) cos(2·x)
Complex cSolve(x^2+9=0,x) cFactor(x^2+9,x) cZeroes(x^2+9,x)	 x = 3·i or x = -3·i (x + -3·i)·(x + 3·i) (3·i -3·i)
Extract getNum(x^2/2+x/5) getDenom(x^2/2+x/5) left(x^2–2x=8) right(x^2–2x=8)	 x·(5·x + 2) 10 $x^2 – 2\cdot x$ 8

F3 Calc
This has many of the calculus commands:
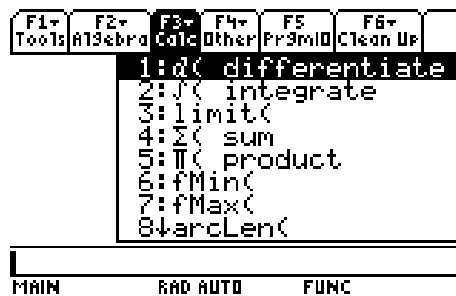
An example of each Calculus command is listed below:
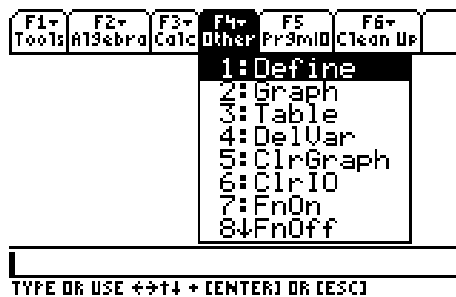
Example	Solution
d(x^3+4x^2,x)	$3\cdot x^2 + 8\cdot x$
∫(3x^2+8x,x)	$x^3 + 4\cdot x$
lim(x^2–4,x,1)	–3
Σ (x^2,x,1,5)	55
Π (x^2,x,1,5)	14400
fMin(x^2–2x,x)	x = 1
fMax(-x^2+4,x)	x = 0
arcLen(√(9–x^2),x,-3,3)	9.42478

taylor(e^(x),x,5)	$\dfrac{x^5}{120} + \dfrac{x^4}{24} + \dfrac{x^3}{6} + \dfrac{x^2}{2} + x + 1$
nDeriv(x^3,x,h)	$3 \cdot x^2 + h^2$
nInt(x^2,x,1,5)	41.33333
deSolve(y''+2y'+y=x^2,x,y)	$\underline{y = (@1 \cdot x + @2) \cdot e^{-x} + x^2 - 4 \cdot x + 6}$ (this is a general solution)

F4 Other

This has miscellaneous commands.

A few examples of useful commands in this menu are listed below:

Example	Solution
Define f(x)=x^–4	Done
f(-1)	-3
Define ab=5	Done
ab	5
DelVar ab	Done
ab	ab

Another useful feature from this menu is the ability to turn the graph plots on and off using the **FnOn** and **FnOff** selections.

F5 PrgmID

This menu accesses CAS programs. This screen will be blank until programs are written or imported.

F6 Clean Up

Selecting Option **1 Clear a–z** is recommended to clear the variables before starting a new session.
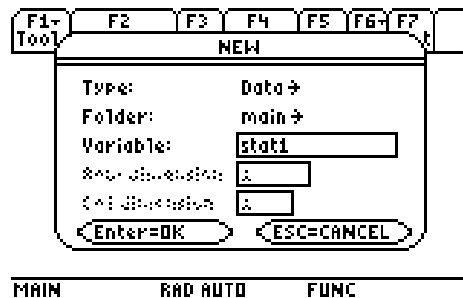
2D Plotting

The 2D plotting features are similar to those of a TI-83 or TI-83+. The yellow options above the **F1 to F5** buttons allow you to perform these operations. To access them, press the yellow ♦ button first. You can also use the **Y=**, **Graph** and **Table** applications on the opening screen.

Statistics

Return to the opening screen by pressing the **APPS** button

To enter values into lists for statistical analysis, select **Data/Matrix/Editor** then **New**. In the **Variable** box, enter the name **stat1** and press **Enter**.

Enter the following numbers into **c1** and **c2** lists.

There are seven menus available in the statistics application. These are:

F1 Tools

F2 Plots
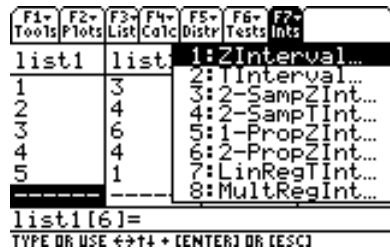
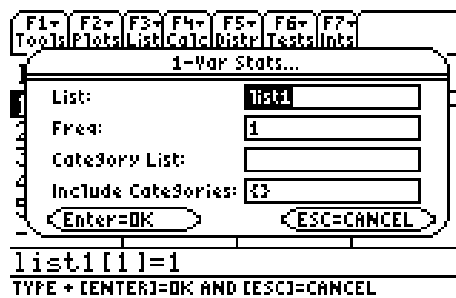**F3 List**

F4 Calc
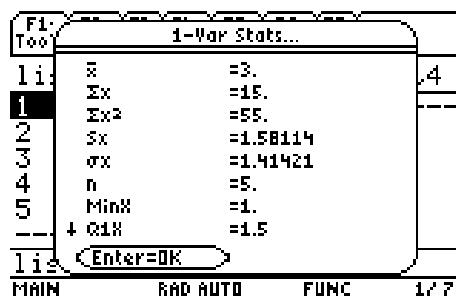

F5 Distr

F6 Tests
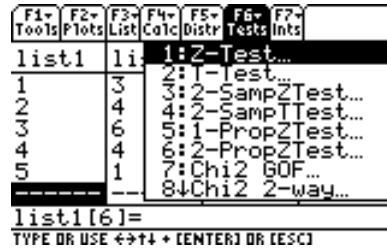
F7 Ints

One simple example of these menus is to select **F4 Calc** then **1–Var Stats** to get this screen:

Use the **ALPHA** key to type in **list1** if it does not appear in the **List** box.
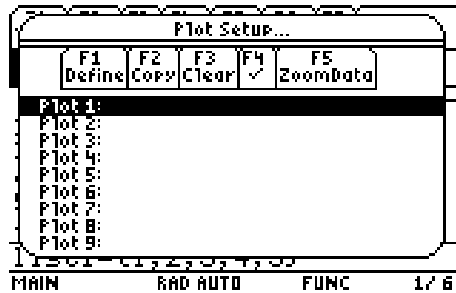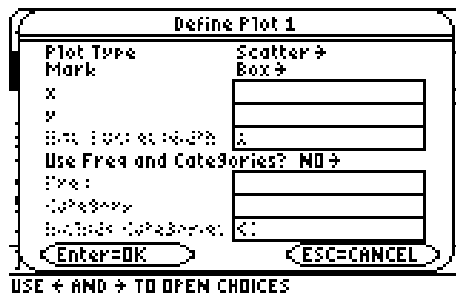
Press **Enter** to get this screen:

Scroll down with the arrow keys to view the rest of the **1–Var Stats** data.
Experiment with the other menus.

Statistical Plotting

To set up a statistical plot, select **F2 Plots** ➔ **Plot Setup** to get this screen

Select **F1 Define** to get this screen.
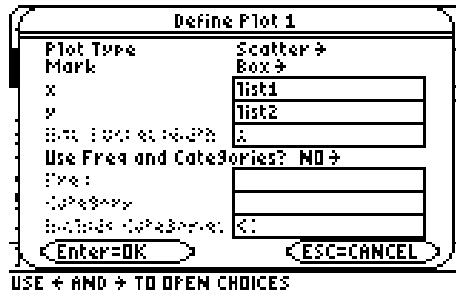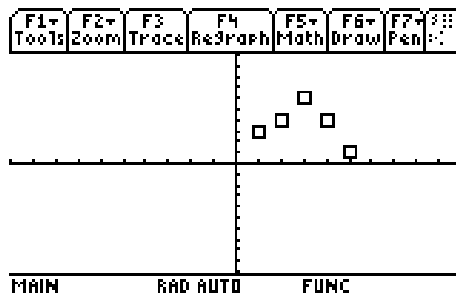

Use the arrow keys to set **Plot Type** to **Scatter** and **Mark** to **Box**.

In the **x** and **y** boxes, use the **ALPHA** button to enter the words **list1** and **list2** respectively.

Select **Enter** twice to get back to the lists.
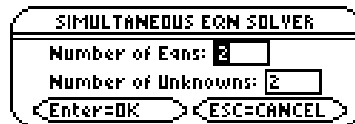Select ♦ **F3** (Graph) to plot the data

Experiment with some of the menus such as **Zoom** and **Trace** to manipulate the plot.

Simultaneous Equations
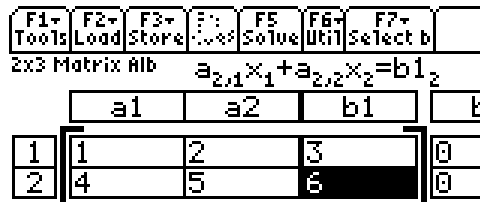
Return to the opening screen by selecting **APPS**

Select **A|b Simultaneous** then **New**.
Enter **2** and **2** for the **Number of Eqns** and **Number of Unknowns**

Select **Enter** and replace the **0s** with the following values:

Select **F5 Solve** to get the solutions.
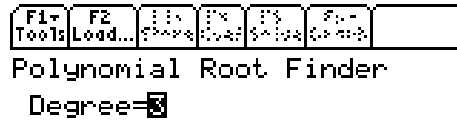
3D Plotting

Press the **MODE** button and use the arrow keys to change the **Graph** setting to **3D**.
Use the same buttons that are used for 2D graphing to enter and graph the equations.
Be aware that there can be a considerable time delay involved with each 3D plot.

Try: **z1 = y^2 – x^2**

             Diamond Valley College, Victoria

Polynomial Root Finder

Return to the opening screen by selecting **APPS**

Select **X₁= Polynomial** then **New** to get this screen:

```
┌─────┬─────┬────┬────┬────┬────┐
│ F1▼ │ F2  │    │    │    │    │
│Tools│Load…│    │    │    │    │
└─────┴─────┴────┴────┴────┴────┘
Polynomial Root Finder
   Degree=3

─────────────────────────────────
ENTER AN INTEGER FROM 1 THROUGH 30
```
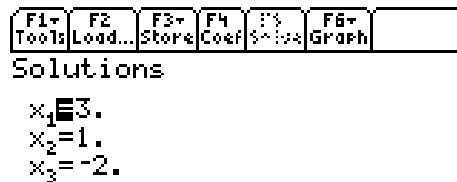
Keep the default setting on 3 and select **Enter**

Enter the following values for a_3, a_2, a_1, and a_0.
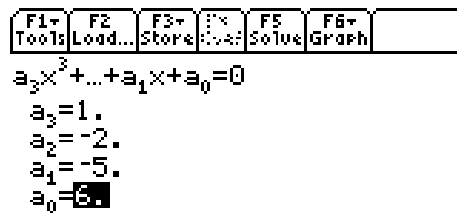
```
┌─────┬─────┬─────┬────┬─────┬─────┐
│ F1▼ │ F2  │ F3▼ │    │ F5  │ F6▼ │
│Tools│Load…│Store│    │Solve│Graph│
└─────┴─────┴─────┴────┴─────┴─────┘
a₃x³+…+a₁x+a₀=0
  a₃=1.
  a₂=-2.
  a₁=-5.
  a₀=6.

────────────────────────────────
USE ▼ ▲ TO GO TO NEXT COEFFICIENT
```

Select **F5 Solve** to get the solutions.

```
┌─────┬─────┬─────┬────┬────┬─────┐
│ F1▼ │ F2  │ F3▼ │ F4 │    │ F6▼ │
│Tools│Load…│Store│Coef│    │Graph│
└─────┴─────┴─────┴────┴────┴─────┘
Solutions
  x₁=3.
  x₂=1.
  x₃=-2.

────────────────────────────────
USE ▼ ▲ TO GO TO NEXT SOLUTION
```