

Science, Technology, Engineering & Maths (STEM) Calculator Guide

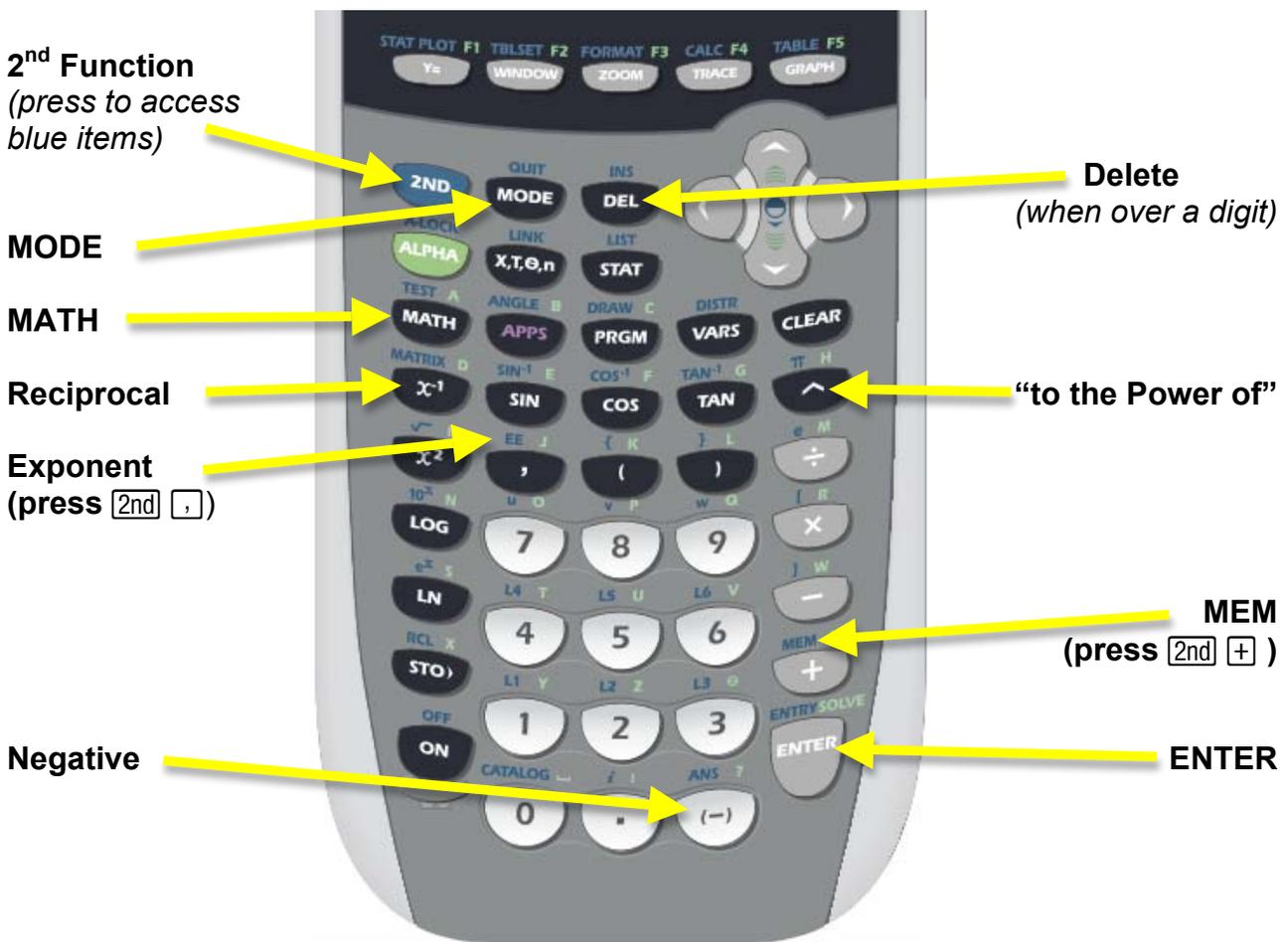
Texas Instruments TI-84 Graphic Calculator (Operating System 2.53)

This short guide is designed to instruct you on how to set up your handheld to perform calculations that you will typically do in Science, Technology, Engineering and Maths. This guide will not attempt to explain the underlying Numeracy or Maths concepts.

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Page 1 - Layout of the keypad, highlighting keys used in this guide.



Page 2 - Using the TI84 in Normal Calculation Mode

Switch the calculator **ON**.

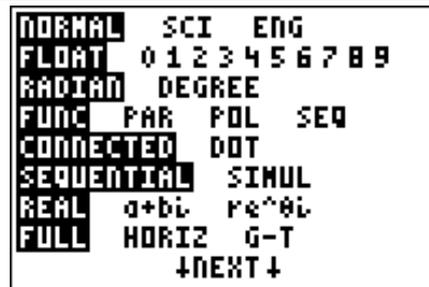
Press the **MODE** button.

Press **ENTER** to select **NORMAL**

Press **▾** to highlight the word **FLOAT**

Press **ENTER** to select **FLOAT**

Then press **2nd****MODE** to **QUIT** back to the calculation page.



A screenshot of the TI-84 Plus calculator's mode selection screen. The screen shows various modes: NORMAL (highlighted), SCI, ENG, FLOAT (with 0123456789), RADIAN, DEGREE, FUNC, PAR, POL, SEQ, CONNECTED, DOT, SEQUENTIAL, SIMUL, REAL, a+bi, re^θi, FULL, HORIZ, G-T, and a cursor pointing to the next screen.

Page 2 - Using the TI84 in Fixed Decimal Place Mode

Switch the calculator **ON**.

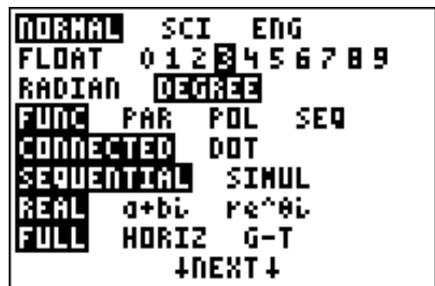
Press the **MODE** button.

Press **▾** to highlight the word **FLOAT**

Press **▸** enough times to highlight the number of decimal places you want.

Press **ENTER** to confirm your choice.

Then press **2nd****MODE** to **QUIT** back to the calculation page.

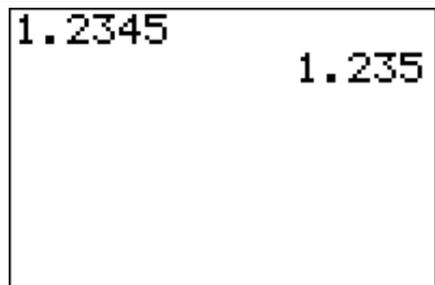


A screenshot of the TI-84 Plus calculator's mode selection screen, similar to the first one, but with the number '3' highlighted in the 'FLOAT' mode line, indicating 3 decimal places.

In this example, we will select 3 decimal places.

*When you type **1****.****2****3****4****5** and then press **ENTER**, the display should look like this:*

Notice that the number has been rounded to 3 decimal places.



A screenshot of the TI-84 Plus calculator display. The top line shows '1.2345' and the bottom line shows '1.235', demonstrating the rounding of the number to three decimal places.

Page 3 - Using the TI84 in Scientific Notation Mode

Switch the calculator **ON**.

Press the **MODE** button.

Press **▶** to highlight the word **SCI**

Press **ENTER** to confirm your choice.

Then press **2nd****MODE** to **QUIT** back to the calculation page.

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```

When you type **12345** and then press **ENTER**, the display should look like this:

Notice that the number has not been rounded, as the **FLOAT** setting was chosen.

Also, **E4** means the same as $\times 10^4$

```
12345
1.2345E4
```

If you wanted Scientific Notation to 3 decimal places, press the **MODE** button.

Change **FLOAT** to **3**, as shown:

Press **ENTER** to confirm and then press **2nd****MODE** to **QUIT** back to the calculation page.

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```

When you type **12345** and then press **ENTER**, the display should look like this:

Notice that the displayed result has now been rounded to 3 decimal places.

```
12345
1.235E4
```

If you wanted to do the calculation

$$(1.23 \times 10^4) \div (5.67 \times 10^{-8})$$

You would type:

1**.****2****3****2nd****,****4****÷****5****.****6****7****2nd****,****(-)****8**

and then press **ENTER**.

Note that pressing **2nd****,****4** means the same as $\times 10^4$

```
1.23E4/5.67E-8
2.169E11
```

The above results are displayed with 3 decimal places (**FLOAT 3**) in Scientific mode.

The same result in just **FLOAT** mode would look like this:

```
1.23E4/5.67E-8
2.169312169E11
```

Page 4 - Using the TI84 in Engineering mode

Switch the calculator **ON**.

Press the **MODE** button.

Press **▶ ▶** to highlight the word **ENG**

Press **ENTER** to confirm your choice.

Then press **2nd****MODE** to **QUIT** back to the calculation page.

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```

*When you type **12345** and then press **ENTER**, the display should look like this:*

*Notice that the number has not been rounded, as the **FLOAT** setting was chosen.*

```
12345
12.345E3
```

Page 4 - Using the TI84 in Degree Mode

Switch the calculator **ON**.

Press the **MODE** button.

Press **▼ ▼ ▶** to highlight the word **DEGREE**

Press **ENTER** to confirm your choice.

Then press **2nd****MODE** to **QUIT** back to the calculation page.

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```

Page 4 - Converting numbers between Decimal and Binary.

The TI84 cannot convert between number bases.

Sorry.

Page 5 - Calculating Reciprocals

The 'reciprocal of a number' is a fraction formed by putting the number in the denominator of a fraction.

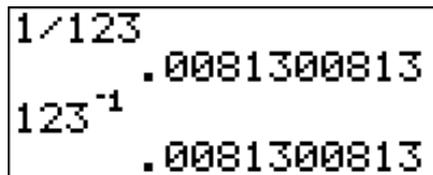
To calculate the reciprocal of 123

EITHER type in $\boxed{1}\boxed{\div}\boxed{1}\boxed{2}\boxed{3}$ to display $1/123$

OR type in $\boxed{1}\boxed{2}\boxed{3}\boxed{x^{-1}}$ to display 123^{-1}

OR type in $\boxed{1}\boxed{2}\boxed{3}\boxed{\wedge}\boxed{(-)}\boxed{1}$ to display 123^{-1}

and then press $\boxed{\text{ENTER}}$.



1/123
.0081300813
123⁻¹
.0081300813

If the calculator displays the answer as a fraction (as shown), then you can convert it to a decimal, by doing the following...

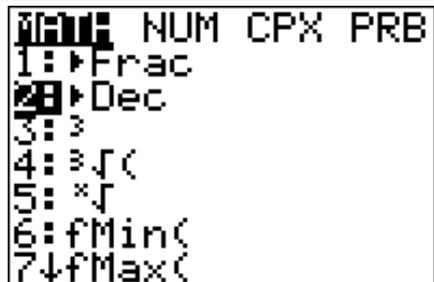


123⁻¹
 $\frac{1}{123}$

Press the $\boxed{\text{MATH}}$ button.

Press $\boxed{2}$ to select \blacktriangleright Dec

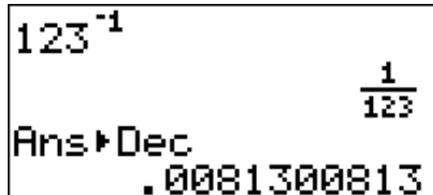
Press $\boxed{\text{ENTER}}$



$\boxed{\text{MATH}}$ NUM CPX PRB
1: \blacktriangleright Frac
2: \blacktriangleright Dec
3: \blacktriangleright
4: \blacktriangleright √(
5: \blacktriangleright √
6: fMin(
7: fMax(
(

This should give a screen as shown:

Notice that the number has not been rounded, as the **FLOAT** setting is currently chosen.



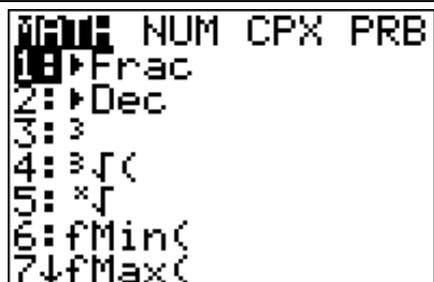
123⁻¹
 $\frac{1}{123}$
Ans \blacktriangleright Dec
.0081300813

It is also possible to convert a decimal to a fraction.

Press the $\boxed{\text{MATH}}$ button.

Press $\boxed{1}$ to select \blacktriangleright Frac

Press $\boxed{\text{ENTER}}$

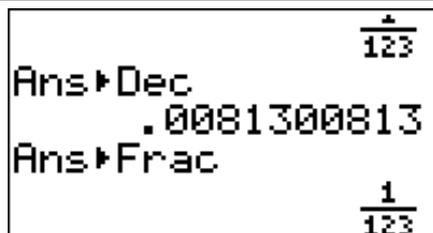


$\boxed{\text{MATH}}$ NUM CPX PRB
1: \blacktriangleright Frac
2: \blacktriangleright Dec
3: \blacktriangleright
4: \blacktriangleright √(
5: \blacktriangleright √
6: fMin(
7: fMax(
(

Sometimes the fraction which is displayed is not exactly equal to the original decimal.

It may only be an approximation.

Be aware that no warning is given if the displayed fraction is only an approximation to the decimal.



Ans \blacktriangleright Dec
.0081300813
Ans \blacktriangleright Frac
 $\frac{1}{123}$

Page 6 - Preparing the TI84 for Exams or Tests.

Before sitting an exam or test, you need to clear the entire memory of your calculator.

Switch the calculator **ON**.

Press **2nd** **+** to access **MEM**

Press **7** to select **7↓Reset...**

```
MEM
1:About
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7↓Reset...
```

You do not want to clear just RAM memory.

You need to clear **ARCHIVE** memory as well.

Press **▶** **▶** to highlight **ALL**

```
RAM ARCHIVE ALL
1:All RAM...
2:Defaults...
```

Then press **1** to select **1:All Memory...**

```
RAM ARCHIVE ALL
1:All Memory...
```

Then press **2** to select **2:Reset**

```
RESET MEMORY
1:No
2:Reset
Resetting ALL
will delete all
data, programs &
Apps from RAM &
Archive.
```

By clearing all the memory, the calculator's **MODE** settings will have been reset as well.

You will have to put the calculator back into **DEGREE** mode....

```
TI-84 Plus Silver Edition
2.53MP
```

```
Mem cleared
```

Press the **MODE** button.

Press **▼** **▼** **▶** to highlight the word **DEGREE**.

Press **ENTER** to confirm your choice.

Then press **2nd****MODE** to **QUIT** back to the calculation page.

```
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNC PAR POL SEQ
CONNECTED DOT
SEQUENTIAL SIMUL
REAL a+bi re^θi
FULL HORIZ G-T
↓NEXT↓
```