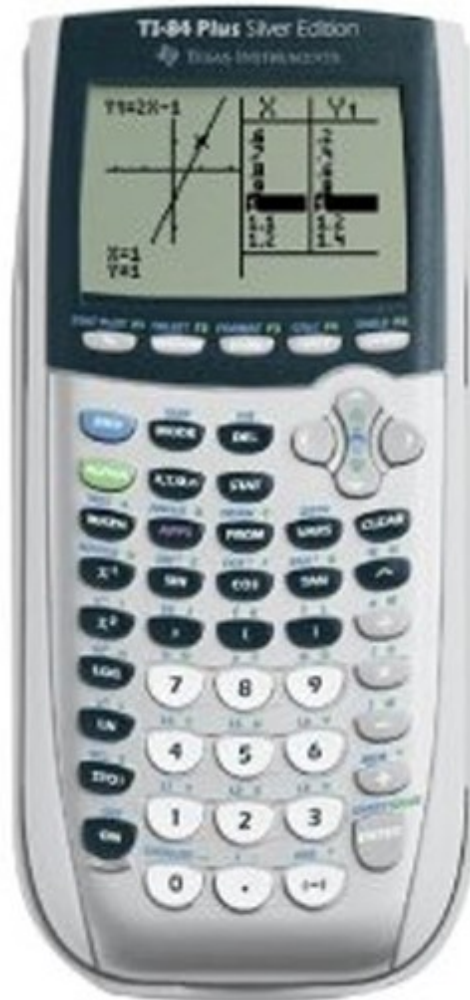


Graphing Calculator Workshops



CHANDLER-GILBERT
COMMUNITY COLLEGE
LEARNING CENTER

Overview

Workshop I

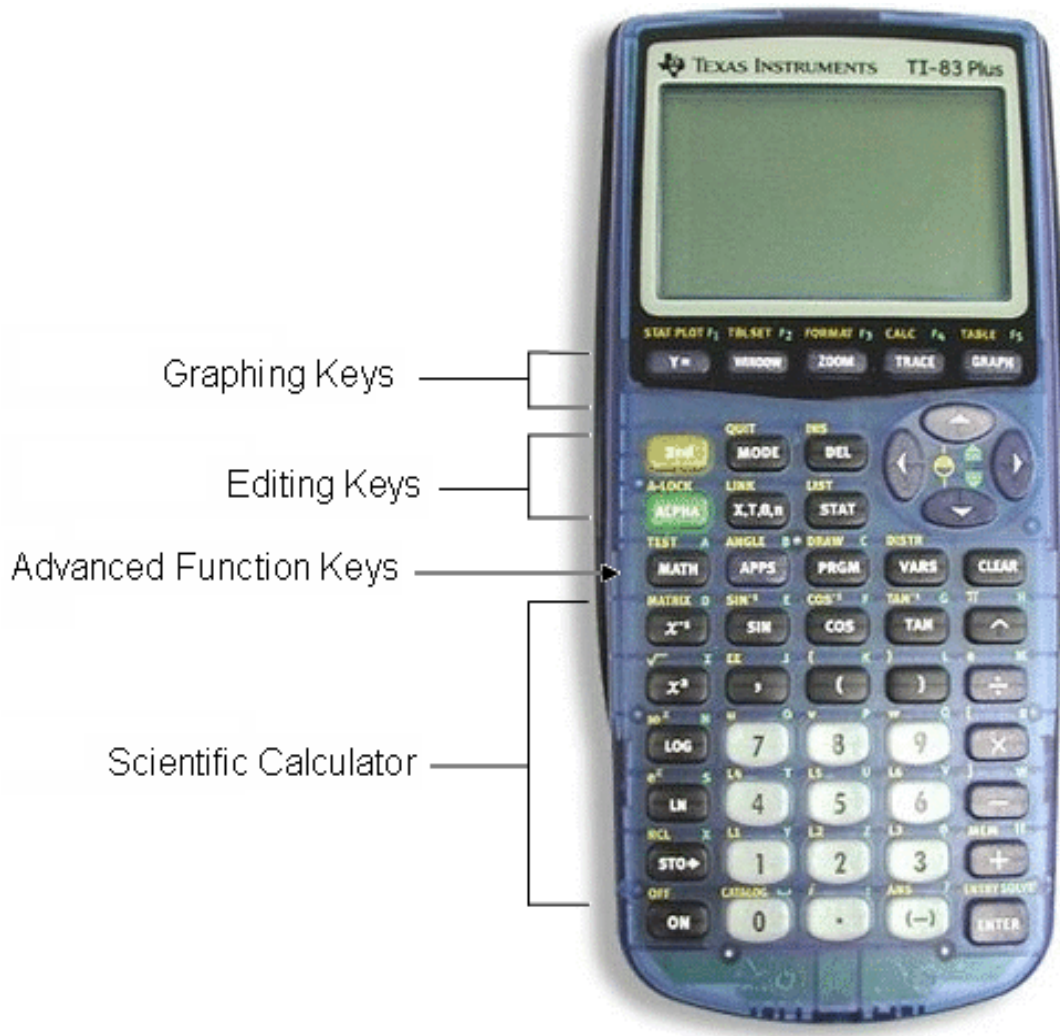
- Learn the general layout of the calculator
 - Graphing Keys
 - Editing Keys
 - Advanced Function Keys
 - Scientific Calculator Keys

- Learn basic operating procedures
 - Order of operations
 - Parentheses
 - Two minus signs
 - Fractions
 - Exponents
 - Fixing typos
 - Basic memory features

Graphing Calculator Workshop I

Graphing Calculator Basics

I. Layout



- Scientific Calculator Keys: Perform the basic operations of arithmetic like any scientific calculator
- Advanced Function Keys: Access menus for additional features of the calculator
- Editing Keys: Change expressions or values that have been entered in; also access options highlighted in yellow or green
- Graphing Keys: Display graphs, scatter plots and tables


II. Operations

1. ON / OFF -
2. 2nd / ALPHA – most keys are color-coded for multiple uses, governed by these two keys.
3. MODE -
4. ENTER -
5. Home Screen – calculation screen
6. QUIT – returns to home screen
7. Contrast and battery

III. The “scientific” portion of your calculator

1. The calculator works using the algebraic order of operations: PEMDAS

Parentheses, **E**xponents, **M**ultiplication/**D**ivision, **A**ddition/**S**ubtraction

2. Type the expression into the calculator exactly as you read it on your page.
BUT you must make sure you utilize parentheses when necessary so that the answer is calculated exactly as you would like it to be. When in doubt, insert the parentheses.
3. Press  to evaluate the expression you have entered on the home screen. The calculator will display the answer on the next line.

PARENTHESES ARE IMPORTANT!

<p style="text-align: center;"><u>Evaluate</u></p> $\frac{4 \times 6}{3 + 5}$
--

$4 * 6 / 3 + 5$	13
$4 * 6 / (3 + 5)$	3
$(4 * 6) / (3 + 5)$	3

4. Why are there two minus signs?

- The subtraction symbol is on the far right of the calculator. This minus sign usually indicates subtracting from a previous number or answer.
- The $(-)$ button just to the left of the enter key indicates a negative number. This minus sign is usually inserted in front of a number.

Evaluate

Both ways

$2 - 3$

2-3	Error	ERR:SYNTAX
■		Quit
		2:Goto

2-3	-1
■	

Evaluate

$-2 - (-3)$

-2-(-3)	1
-2- -3	1

5. Fractions (Classic OS)

- Use the divide key (on far right of calculator) to indicate a fraction.
- If you are calculating with a fraction, use parentheses around the fraction to indicate that it is one quantity.

Evaluate

$\frac{2}{3/4}$

2/3/4	.166666667
2/(3/4)	2.666666667

6. Converting between decimal and fraction (and vice versa) using one of the MATH menus.

c. Decimal to fraction, if possible:

type the decimal— **MATH** — **Frac** — **ENTER** — **ENTER**
The answer will be given in lowest terms.

Convert the answers to the previous calculations to fractions.

```
2/3/4
.1666666667
Ans▶Frac
1/6
2/(3/4)
2.666666667
Ans▶Frac
3/2
```

Note that some decimals do not have fraction forms, e.g., e , $\sqrt{2}$

d. Fraction to decimal:
Just divide, OR

Type the fraction— **MATH** — **Dec** — **ENTER** — **ENTER**

Convert to a decimal

$\frac{4}{12}$

```
4/12
.3333333333
4/12▶Dec
.3333333333
```

6. Exponents

- Squaring button x^2
- Square root – 2^{nd} x^2 Note that with the Classic OS, the square root button automatically opens a parenthesis before you enter the expression you'd like to evaluate; with the MathPRINT OS, no parenthesis appears and you “toggle” out using the right arrow key.
- Other powers - use the carrot key \wedge
- Other roots – use the x^{th} root key under the $MATH$ menu:

index of the radical – $MATH$ – $\sqrt[x]{}$ – () – type your expression –)

- Fractional exponents

Evaluate

$5^{2 \cdot 3}$

$5^{(2 \cdot 3)}$

$(\sqrt[3]{8})^4$

$5^{2 \cdot 3}$	75
$5^{(2 \cdot 3)}$	15625
$\sqrt[3]{(8)^4}$	16
$8^{(4/3)}$	$\frac{64}{\sqrt{2}}$

7. Fixing mistakes: Clear , Delete, or Insert.

- CLEAR** – completely erases everything on the screen.
- DEL – erases the value that the cursor is on. Move the cursor using arrows.
- To insert (**INS**) a character into your expression
 - Put your cursor to the spot where you want the new character to go
 - Press 2^{nd} DEL (The old character will be blinking)
 - Type in the new character or expression
 - Return to original place.

8. Your calculator's got memory!

- a. To use the previous answer in a new calculation, we need the ANS option:
 - i. Enter the next operation to use the previous answer as the first number.
 - ii. Use 2nd (\leftarrow) to call the previous answer into an expression.
- b. To restore the expression you've previously entered (after you have pressed the ENTER key), use the ENTRY option:

2nd ENTER

**Use the answer to
the first
calculation in the
next two.**

$$2 + 8$$

$$\frac{\text{Ans}}{2}$$

```
2+8           10
Ans/2         5
9-Ans*3       -6
█
```

**Restore the following
expression after you
have the result.**

$$\frac{1 + \sqrt{1 - 4(2)(-3)}}{2(2)}$$

```
(1+√(1-4(2)(-3)))
)/(2*2)
1.5
(1+√(1-4(2)(-3)))
)/(2*2)█
```