

## Learning the Calculator Mode of the TI-83 Plus

Keys to Know:

- **ON** (OFF is  $2^{nd}$  ON.)
- **YELLOW** key: ( $2^{nd}$  key) lets you do what is in Yellow above that key.
- **ALPHA** key: Lets you enter alpha characters. (except use  $\boxed{x,T,\theta,n}$  key for  $x$ )
- Simple operators: Blue keys on right:  $\boxed{+}$ ,  $\boxed{\times}$ ,  $\boxed{-}$ ,  $\boxed{\div}$
- NOTE: Negative key is gray key to the left of ENTER
- If you get an ERR: SYNTAX: choose GOTO to see where your error is!
- Remember to use parentheses to affect order of operations! When you have a fraction, surround numerator and denominator with parentheses if either is more than one term. See #10 below.
- $\boxed{x^2}$  Key will square the number entered before it
- Raising to **higher power**: use the "caret" key  $\boxed{\wedge}$  e.g.  $2 \boxed{\wedge} 3 = 2 \cdot 2 \cdot 2 = 8$
- Taking a **square root** is above the  $\boxed{x^2}$  key (e.g..  $2^{nd} \boxed{x^2} 25 \boxed{Enter}$  gives 5 )
- **Cube root**:  $\boxed{Math}$  then 4:  $\sqrt[3]{125}$  is 5. **Higher index** than 3: Enter index, then  $\boxed{Math}$  then 5:  $\sqrt[5]{}$
- **Absolute value**:  $\boxed{Math}$ , arrow right to NUM, press  $\boxed{Enter}$  to see *abs*( Enter number then use  $\boxed{|}$  to get 'outside' the absolute value symbol.
- $\pi$  is  $2^{nd} \boxed{\wedge}$  (above the  $\boxed{\div}$  key)
- $\boxed{EE}$  gives you a "\*10 to a power". If you get an answer that is longer than 10 digits, it will be given in scientific notation with E replacing "\*10 to a power". E.g.12300000000 is 1.23E10.
- $\boxed{Mode}$  lets you change several settings. Arrow to setting, then arrow right to desired choice & hit Enter. Usually you will have all settings left, but to change to fixed decimal change FLOAT to your choice; to use complex numbers change REAL to  $a + bi$ ; choose RADIAN or Degree as needed.

**CLEAR** key clears whole line. **DEL** key clears the character the blinking cursor is ON

**INS** ( $2^{nd}$  DEL) inserts one character where the cursor is.

**ANS** (above the (-) key) puts the last Answer on the screen.

**ENTRY** (above the  $\boxed{ENTER}$ ) puts the entire last entry on the screen (in case you need to change it just a little and don't want to reenter it completely). Then use Arrow Keys to move cursor & edit it.

**STO** To store a value in X or another variable, enter value then  $\boxed{STO}$  then  $\boxed{x}$  then  $\boxed{Enter}$

Try these:

1.  $48 \div -2$  \_\_\_\_\_
2.  $14^2$  \_\_\_\_\_
3.  $74 + 4 \div 2$  \_\_\_\_\_
4.  $(74 + 4) \div 2$  \_\_\_\_\_
5.  $65 - 131$  \_\_\_\_\_
6.  $-63.14 + 45.98$  \_\_\_\_\_
7.  $(-4)^4$  \_\_\_\_\_
8.  $-4^4$  \_\_\_\_\_
9.  $\frac{4}{3}\pi r^2$  when  $r = 1.3$  \_\_\_\_\_
10.  $\frac{21}{-4+7}$  \_\_\_\_\_

(Answers: -24, 196, 76, 39, -66, -17.16, 256, -256, 7.079055446, 7)

For MT124/MT133 and above students:

First store -2 in x. Then enter each expression and hit Enter; check if you got the correct value. If not, check your parentheses!

- a)  $2x + 3$                       -1
- b)  $\frac{4x+1}{5x}$                        $\frac{7}{10}$
- c)  $\frac{x}{x+2} - 3$                       Err : Divide by 0
- d)  $\frac{-x+3}{4}$                        $1 \frac{1}{4}$
- e)  $|x-1|$                       3
- f)  $|x|-1$                       1
- g)  $\sqrt{x+6} + 1$                       3

(These are some difficult expressions you may need to enter into  $\boxed{Y=}$ .)

Use  $2^{nd}$  Mode (QUIT) to return to calculator screen when in menu or any place.

## Graphing on the TI 83 Plus Calculator

If the screen is dim, hit  $2^{nd}$  (top left) then  $\boxed{\text{Up Arrow}}$ .

Doing this sequence several times makes it brighter.  $2^{nd}$   $\boxed{\text{Down arrow}}$  dims the screen.

$\boxed{\text{Clear}}$  Clears anything entered on that line (in  $y=$  mode) or the whole screen

$\boxed{Y=}$  Allows you to enter equations (up to 7) which will then be graphed when you hit Graph.

$\boxed{\text{Graph}}$  Graphs any and all equations entered in  $y=$  screen if the  $=$  sign in the equation is darkened.

- ◆ If the equal sign is regular, it will not graph.
- ◆ To change the equal sign to darkened, put blinking cursor over the  $=$  and hit the Enter key.

### ***Reasons your graph does not display:***

- Screen has been dimmed (see top of page)
- Your window is improperly set (see below to change by  $\boxed{\text{Zoom}}$  or  $\boxed{\text{Window}}$ )
- If your axes will not show, hit  $2^{nd}$   $\boxed{\text{Zoom}}$  and be sure **Axes On/Axes Off** is highlighted.
- Stat Plot may be set. To clear Stat Plot:
  - Hit  $\boxed{Y=}$ .
  - If *Plot1*, *Plot2*, *Plot3* (at top) are highlighted, arrow to them, and hit  $\boxed{\text{ENTER}}$  to turn each off.

$\boxed{\text{Zoom}}$  Choose 6 (Standard) to show standard view of graph (around origin).

Choose 5 (Square) has proper dimensions. Choose 4 (Decimal) to trace x value by tenths.

$\boxed{\text{Window}}$  will let you set the *view* of the function.

- ◆ Xmin is leftmost value on x axis. X max is rightmost value on x axis that will appear on screen.
- ◆ Ymin is lowest value on y axis. Ymax is highest value on y axis.
- ◆ Yscl and Xscl are scale-how often tick marks appear on the x and y axes. 10 means once every 10.
- ◆ Do not change Res value.

$\boxed{\text{Trace}}$  Lets you move your cursor along the line (or other curve). The (x,y) coordinate of the current point displays at the bottom.

### **To move to a specific point on the graph** (and show (x,y) coordinate)

- hit  $\boxed{\text{Trace}}$ , enter the x value(x coordinate)
- hit the  $\boxed{\text{Enter}}$  key
- the cursor will move to that point and show the y coordinate below.

### **Hints on entering equations (functions):**

- Use the  $\boxed{x,T,\theta,n}$  key ( $3^{rd}$  row,  $2^{nd}$  column from top on calculator) when entering independent variable into  $\boxed{y=}$
- The *Subtraction symbol* is in the right column; The *negative sign* is to the left of the Enter key
- If you need to enter a fraction (rational expression) with more than one term in the numerator or denominator, you **must** use parentheses to group numerator or denominator.

To return to Calculator Mode, hit  $2^{nd}$   $\boxed{\text{Mode}}$