

## TI-86 Introductory Video/DVD Notes

These notes are provided so that students watching the TI-86 Introductory Video/DVD will not have to take notes while watching the video, but can instead concentrate on using the calculator.

### Order of operations

The calculator follows the standard mathematical order of operations:

                Parentheses                        Exponents                        Multiplication/Division                        Addition/Subtraction

### Screen contrast

Press **2<sup>nd</sup>** and then the **up** arrow, for darker characters.

Press **2<sup>nd</sup>** and then the **down** arrow, for lighter characters.

### Entering and editing characters

To delete the character at the cursor, press the **DEL** key.

To insert a character in front of the cursor, without erasing the character that is there, press **INS**, above DEL. Then press the appropriate character key.

To clear the problem in progress, or to clear the entire screen, press the **CLEAR** key.

Use the  $\div$  key for division and to write a fraction bar. The screen will always show a fraction bar.

### Changing decimals to fractions (and accessing the $\rightarrow$ FRAC capability through CATALOG and CUSTOM)

Choose **CATLG** with **2<sup>nd</sup>** **CUSTOM**.

Choose **CATLG** with **F1**.

Get to the beginning of the CATALOG list by pressing the **A** key, above the LOG key.

Use the **up** arrow to get to the end of the list, and then use the up arrow repeatedly to find  $\rightarrow$ **FRAC**.

Choose **CUSTM** (at **F3**).

Choose **F1**, **F2**, **F3**, **F4**, or **F5** so that  $\rightarrow$ **FRAC** will be inserted in that position.

Exit back to the home screen by using the **EXIT** key *as many times as necessary*.

From now on, the  $\rightarrow$ **FRAC** capability can be accessed from **CUSTOM** when needed on this calculator.

To convert a decimal to a fraction:

Enter the decimal to be converted.

Press the **CUSTOM** key.

Press the appropriate F key for  $\rightarrow$ **FRAC**.

Press **ENTER**.

### Returning to the Home Screen

There are 2 choices to return to the Home Screen at any time:

Press **2<sup>nd</sup>** and **QUIT** (located above **MODE**), or press **EXIT** as many times as necessary.

### Retrieving the answer from the previous problem

**Starting** a problem with an addition, subtraction, multiplication, or division symbol automatically instructs the calculator to operate on the previous answer; **Ans** will appear on the screen directly in front of the operation symbol.

To **retrieve** the answer from the previous problem at any time, press **2<sup>nd</sup>** and then press the **ANS** key (above the negation key).

### Retrieving an entire previous problem

Though it is not possible to scroll up on the calculator, previous problems can easily be accessed by pressing **2<sup>nd</sup>** **ENTRY** (above **ENTER**). Pressing the **2<sup>nd</sup>** **ENTRY** combination multiple times will access multiple problems.

### Subtraction versus negation

The **subtraction** key is a black key located in the right column of the calculator. This key is used to perform the operation of *subtraction*.

The **negation** key is gray and is located in the bottom row of the calculator next to the **ENTER** key. This symbol is used directly before a number or variable to change the *sign* of the number/variable.

## Powers and roots

- To evaluate  $3^2$ , press **3** and then press the  $x^2$  key, which is located in the left column of the keyboard.
- To evaluate  $3^4$ , press **3** and then the  $\wedge$  key, which is located in the right column of the keyboard. Then press **4**.
- To evaluate  $\sqrt{9}$ , press **2<sup>nd</sup>**, followed by  $\sqrt{\phantom{x}}$ , which is located in the left column. Then press **9**.
- To evaluate, there are two methods that can be used:  
One method is to use the  $\sqrt[x]{\phantom{x}}$ . For  $\sqrt[3]{27}$ , type **3**. Then find  $\sqrt[x]{\phantom{x}}$  at: **MATH MISC MORE**  $\sqrt[x]{\phantom{x}}$ . Then press **27**. The screen of the calculator will show as  $3\sqrt[3]{27}$ .  
Another method is to remember that  $\sqrt[3]{27}$  means  $27^{1/3}$ ; raise 27 to the  $1/3$  power, using the  $\wedge$  key. The entire exponent must be in parentheses.
- To evaluate  $\sqrt{-9}$ , the calculator should be in *rectangular* MODE (the 4<sup>th</sup> option in MODE). The result of  $\sqrt{-9}$  will display as the complex ordered pair (0,3), which means  $0+3i$ . Likewise, use the ordered pair form to *enter* a complex number; for example, enter  $2 + 3i$  as (2,3).

## Constants and conversions

- Some commonly used constants, such as Avagadro's number, are built into the calculator. **CONS** is above the 4 key. The steps are: **CONS BLTIN**. For Avagadro's Number, choose **Na** next. Press ENTER.
- The conversion capability is in **CONV**, above the 5. To convert  $-5^\circ\text{C}$  to Fahrenheit, type (-5) in the HomeScreen. Note that -5 must be in parentheses. The next steps are: **CONV TEMP °C**. Now choose **°F** after the arrow. The screen should look like  $(-5)^\circ\text{C}\rightarrow^\circ\text{F}$ .

## Absolute value and inverse

To evaluate  $|-5|$ , access **abs** from the CATALOG. The screen should look like **abs -5**.

To evaluate  $2^{-1}$ , press the **2**, followed by the  $x^{-1}$  capability, which is located above the EE key. The screen shows  $2^{-1}$ .

## Scientific notation

A number on the screen such as 2.697E-4 means  $2.697 \times 10^{-4}$ , which equates to .0002697 in standard form.

**Evaluating** a function can be done in three ways: **eval**, with **function notation**, and **TABLE**:

- **eval** can be found in the CATALOG. Enter **eval** into the CUSTOM menu if the intent is to use it regularly. Enter a function, such as  $y = x^2$ , with **GRAPH** and **y(x)=**. To evaluate the function for an x-value of -5, the screen should look like: **eval -5**. The calculator will evaluate all the functions that are turned on.
- **Function notation**  
Once the function has been entered into **GRAPH** and **y(x)**, the screen should be made to look like **y1(-5)**, if the function is entered at y1. The **y1** is entered with the **yellow 2<sup>nd</sup> key**, then the **blue ALPHA key**, and then the **y key**.
- **TABLE**  
The function must first be entered with **GRAPH** and **y(x)**. The **TABLE** key is located to the right of GRAPH. Two options appear: TABLE and TBLST (which means Table Set).  
Before *using* the table, *set the table*: choose TBLST. Then, choose either **Auto** or **Ask**:  
**Auto**: If a regular increment is desired, then  $\Delta Tbl$  must be given that value. The *Independent* variable must be set to *Auto*. Now access the **TABLE** with F1. The calculator will evaluate all the functions that are turned on.  
**Ask**: If a variety of X-values is desired, the  $\Delta Tbl$  will be of no consequence, but the *Independent* variable must be set to *Ask*. Now access the **TABLE** with F1. Type values for X, pressing ENTER after each. The calculator will evaluate all the functions that are turned on.

## POLY (located above PRGM)

To solve a polynomial equation such as  $0 = 3x^2 + 14x - 5$ , access **POLY**. When asked for the order, enter the number that represents the **largest power of x** existing in the polynomial, which in this case is 2. Press ENTER. When asked for a2, a1, and a0, **enter the coefficients** 3, 14, and -5 respectively. Choose **SOLVE** with F5.

## Turning off the calculator

Turn off the calculator by pressing **2<sup>nd</sup>** and then **OFF**, which is located above the ON key.