

TI-86 Introductory Video Notes

These notes are provided so that students watching the TI-86 Introductory Video 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, PEMDAS:

 Parentheses Exponents Multiplication/Division Addition/Subtraction

Screen contrast

Press **2nd** and then the **up** arrow, for darker characters.

Press **2nd** 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**, by pressing the yellow **2nd** key followed by the DEL key. 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 \triangleright FRAC capability through CATALOG and CUSTOM)

- We'll first put the " \triangleright FRAC" into the custom menu so that it will be easy to find later:
Choose **CATLG** with **2nd** CUSTOM \rightarrow Choose **CATLG** with F1 \rightarrow Get to the beginning of the CATALOG list by pressing the **A** key, above the LOG key \rightarrow Use the **up** arrow to get to the end of the list, and then use the up arrow repeatedly to find " \triangleright FRAC" \rightarrow Choose **CUSTOM** (at F3) \rightarrow Choose **F1, F2, F3, F4, or F5** so that " \triangleright FRAC" will be inserted into that position \rightarrow Exit back to the home screen by using the **EXIT** key as many times as necessary.
- To convert a decimal to a fraction:
Enter the decimal to be converted \rightarrow Press the **CUSTOM** key \rightarrow Press the appropriate F key for " \triangleright FRAC."
Press ENTER.

Returning to the Home Screen

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

Press **2nd** and **QUIT** (located above EXIT), or press the **EXIT** key 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 you chose.
- To **retrieve** the answer from the previous problem at any time, press **2nd** and then press the **ANS** key (above the negation key at the lower right of the keyboard).

Retrieving an entire previous problem

Though it is not possible to scroll up on the calculator, previous problems can easily be accessed by pressing **2nd** **ENTRY** (above the ENTER key). Pressing the **2nd** **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 **x²** key, which is located in the left column of the keyboard.
- To evaluate 3^4 , press **3** and then the **^** key, which is located in the right column of the keyboard. Then press **4**.
- To evaluate $\sqrt{9}$, press **2nd**, followed by $\sqrt{\quad}$, which is located in the left column above **x²**. Then press **9**.
- To evaluate $\sqrt[3]{27}$, there are two methods that can be used:

- One method is to use the $\sqrt[x]{}$. To evaluate $\sqrt[3]{27}$, type **3** → Find $\sqrt[x]{}$ at **MATH** → **MISC** → **MORE** → $\sqrt[x]{}$ → Then press **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 4th option in MODE, above MORE). 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** (at F1). For Avagadro's Number, choose **Na** next. Press ENTER.
- To convert -5°C to Fahrenheit, type (-5) in the HomeScreen. Note that -5 must be in parentheses. The conversion capability is in **CONV**, above the 5. The next steps are: **CONV** → **TEMP** → $^{\circ}\text{C}$. Now choose $^{\circ}\text{F}$ after the arrow. The screen should look like **(-5) $^{\circ}\text{C}$ ▷ $^{\circ}\text{F}$** . Press ENTER.

Absolute value and inverse

- To evaluate $|-5|$, access **abs** from the CATALOG: Choose CARLG-VARS which is located above the CUSTOM button → CATLG → Choose A by pressing the LOG button to get to the top of the A listings → When the ▷ is next to abs, press ENTER → Type -5 → Press ENTER.
- To evaluate 2^{-1} , press the **2**, followed by the x^{-1} , which is located above the EE key. The screen shows 2^{-1} . Press ENTER.

Scientific notation

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

Evaluating a function can be done in three ways: (1) **eval**, (2) **function notation**, and (3) **TABLE**

First enter a function, such as $y = x^2$ with **GRAPH** and **y(x)=**.

- **eval** can be found in the CATALOG. You may wish to enter **eval** into the CUSTOM menu if you intend to use it regularly. Use the instructions above. Or, you can access **eval** with: CATLG → CATLG → Press E, at the \wedge key, since that gets us to the e portion of the alphabet → arrow down to eval. 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** The screen should be made to look like **y1(-5)**. The lower case y is entered with the **yellow 2nd key**, then the **blue ALPHA key**, and then the **y** key. Type in the **1** followed by (-5).
- **TABLE** The **TABLE** key is located to the right of the GRAPH key on the keyboard. 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 ΔTbl 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 ΔTbl 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**, located above the PRGM key. 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 **2nd** and then **OFF**, which is located above the ON key.