

## ***PEN-International 研讨会***

*教授聋人大学生数学: NTID(美国聋人技术学院) 模式*

*教授: Daniele & Carr*

*六月 2004*

### 了解 TI-83 计算器 代数学基础 (实验报告例子)

备注: 因演讲稿需要, 此学生实验报告曾被修改.

本次实验目的是学习使用 TI-83 计算器. 你将会使用目录, 学习按键顺序和窗口显示.

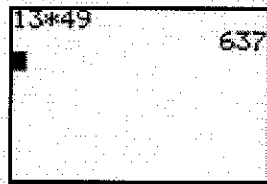
#### 调节窗口显示的清晰度

在窗口显示不清楚时你可以做什么? 你可以按 **2nd** 并且 按住向上或向下的箭头 **▲** or **▼** 来调节窗口的清晰度.

使用 **ENTER** 键

**ENTER** 键是用来计算结果的. 要计算 13 乘以 49, 输入按键顺序:

13 **×** 49 **ENTER**



窗口将会显示这个结果

当你显示结果时, 你通常使用窗口显示, 而不是按键顺序. 注意窗口显示会同时显示计算问题和结果.



## *A PEN-International Workshop*

*Teaching Mathematics to Deaf College Students: The NTID Model*

*Professors Daniele & Carr*

*June 2004*

### Getting to Know the TI-83 Calculator Foundations of Algebra (Sample Lab Paper)

**NOTE:** This is an example of a student lab paper that has been revised for purposes of presentation.

The purpose of this lab is to learn about using the TI-83 calculator. You will use **menus**, learn about **key sequences** and **window displays**.

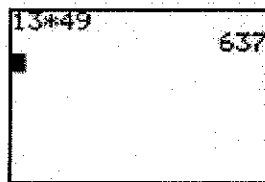
### **Adjusting Sharpness of Window Display**

What can you do if your window display is not clear? You can adjust the sharpness of the window display by pressing **[2nd]** and holding the up or down arrow **[▲]** or **[▼]**.

### **Using the **[ENTER]** Key**

The **[ENTER]** key is used to compute an answer. To figure out 13 multiplied by 49, type the **KEY SEQUENCE**:

13 **[×]** 49 **[ENTER]**



With this resulting **WINDOW DISPLAY**

When you show your work, you will usually use a **WINDOW DISPLAY**, not a key sequence. Note that the window display shows both the problem and the answer.

## 使用 **CLEAR** 键

**CLEAR** 键是用来删除一行命令或清空窗口内容的。现在试一试。它也能被用来离开菜单选项并且回到主屏幕。

## 使用 **DEL** 键:

**DEL** 键是用来删除字符的。如果你输入 123345, 你想要删掉'多余'的 3, 你可以按向左的箭头直到光标停在 3 上面, 然后按 **DEL**。

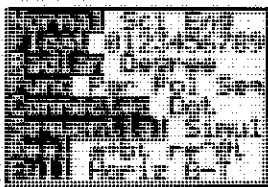
## 使用 **INS**:

**INS** 是在 **DEL** 键的上方的黄色键。因为它是黄色的, 你将会需要按黄色的 **2nd** 键然后再按 **INS** 才能使用它。

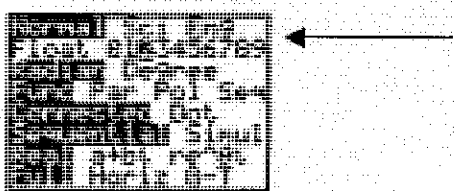
- 输入 123567
- 插入一个“4”在 3 和 5 中间。

## 使用 **MODE** 键:

你可以选择如何显示小数位。按 **MODE** 键来看:



我们将会讨论几个设置。比如, 如果要显示小数点后 **2** 位的话, 用:



要设定此种模式, 你必须在你选择后按 **ENTER**。

## Using the **CLEAR** Key

The **CLEAR** key is used to remove a whole line or to clear the whole window. Try it now. It can also be used to **leave a menu** and go back to the home screen.

## Using the **DEL** Key:

The **DEL** key is used to delete characters. If you type the number 123345, and want to get rid of the 'extra' 3, you can press the left arrow key until the cursor is on top of the 3, then press **DEL**.

## Using **INS**:

**INS** is above the **DEL** key and is shown in YELLOW. Since it is yellow, we need to press the yellow **2nd** key and then **INS** to use it.

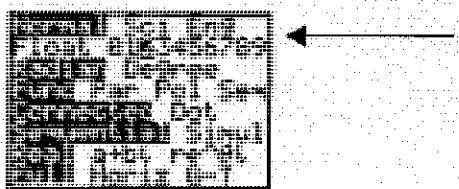
- Type the numbers 123567
- Insert a "4" between the 3 and the 5.

## Using the **MODE** Key:

You can choose how your decimals are displayed. Press the **MODE** key to see:




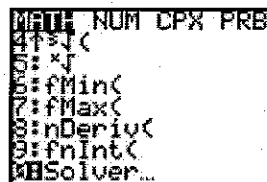
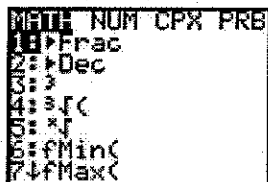
We will discuss several of these settings. For example, to set the number of decimal places displayed to **2**, use:



To set the mode, you must press **ENTER** after making the selection.

使用 **MATH** 目录:

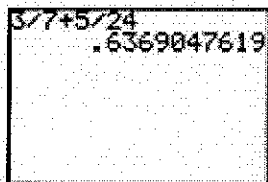
按 **MATH** 来看目录选项, 向下滚动卷标  来看最后一个:



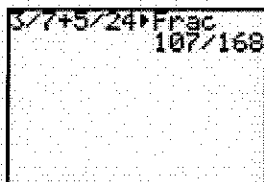
- |                          |           |
|--------------------------|-----------|
| 1: >Frac                 | 表示结果是个分数  |
| 2: >Dec                  | 表示结果是个小数  |
| 3: $\wedge$              | 数的立方      |
| 4: $\sqrt[\quad]{\quad}$ | 数的立方根     |
| 5: $\sqrt[x]{\quad}$     | 数的 x 次方根  |
| 6: fMin(                 | 某函数的的最小值. |
| 9: fnInt(                | 某函数的整数值得  |

### 1: >Frac

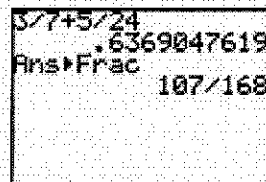
但我们相加  $3/7$  和  $5/24$ , 我们的结果将是一个分数或十进制小数.



or



or

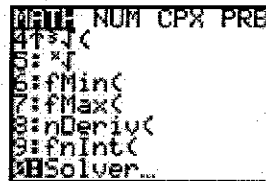
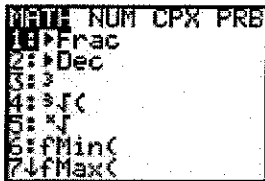


窗口最后输入的按键顺序是:

3  $\div$  7  $+$  5  $\div$  24 **MATH** 1: > Frac **ENTER**

## Using the **MATH** menu:

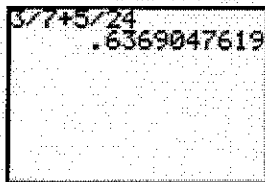
Press **MATH** to see the choices on the menu, and scroll down with  $\downarrow$  to see the last one:



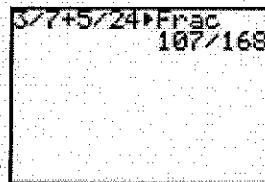
- |                      |  |
|----------------------|--|
| 1: >Frac             | expresses an answer as a fraction  |
| 2: >Dec              | expresses an answer as a decimal   |
| 3: 3                 | <b>cubes</b> a number  |
| 4: $\sqrt{\quad}$    | finds the cube root of a number  |
| 5: $\sqrt[x]{\quad}$ | finds the xth root of a number   |
| 6: fMin(             | finds the minimum value of a function on an interval.                              |
| 9: fnInt(            | finds the numeric integral of a function with respect to a variable on an interval |

### 1: >Frac

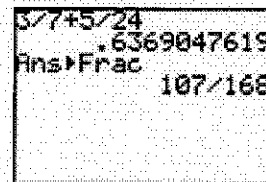
When we add  $3/7$  and  $5/24$ , our answer can be either a fraction or a decimal.



or



or



The key sequence for the last window is:

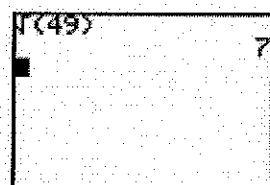
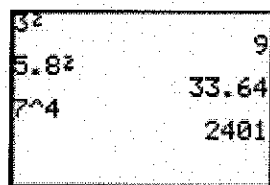
3  $\div$  7  $+$  5  $\div$  24 **MATH** 1: > Frac **ENTER**

使用  $x^2$  ,  $\wedge$  和  $\sqrt{\quad}$  键:

$x^2$  键是用来计算象  $3^2$  和  $5.8^2$  数值. 只要简单先按数字键接着按  $x^2$  键紧跟着  $\text{ENTER}$ .

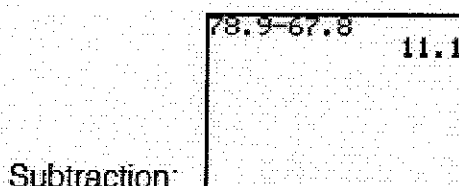
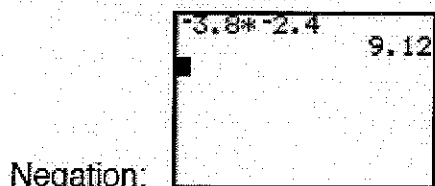
任何指数运算, 你可以使用  $\wedge$  键

平方根是  $x^2$ , for  $x \geq 0$  的反函数. 平方根运算键是在  $x^2$  键的上方的黄色按键. 因为是黄色的按键, 必须按  $2\text{nd}$   $\sqrt{\quad}$ .



使用负数键  $\ominus$  和相减键  $\omin�$

请注意在 TI-83 计算器里负数和相减键的区别



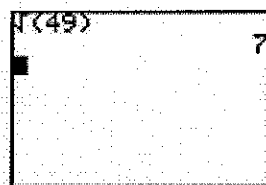
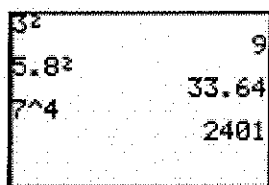
注意: 负数符号比减号要显示在窗口的靠上方而且较小.

## Using the $x^2$ , $\wedge$ and the $\sqrt{\phantom{x}}$ keys:

The  $x^2$  key can be used to compute values such as  $3^2$  and  $5.8^2$ . Simply press the **number** first and then the  $x^2$  key followed by **ENTER**.

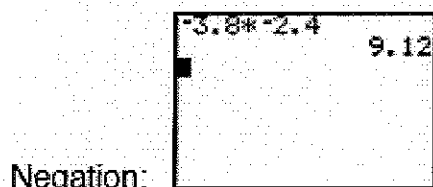
For any exponent, you can use the  $\wedge$  key

Square Root is the inverse function of  $x^2$ , for  $x \geq 0$ . The square root operation is above the  $x^2$  key and is **yellow**. Press **2nd**  $\sqrt{\phantom{x}}$  to get the square root.



## Using the Negation Key $\ominus$ and Subtraction Key $-$

Note below the difference between the negation and the subtraction symbols on the TI-83



**NOTE:** The negation symbol is smaller and higher on the window display than the subtraction symbol.



贮存变量:

找出以下按键:

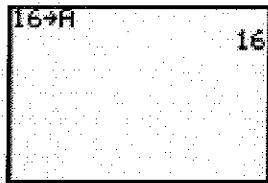
**ALPHA** 此绿色键是读取内存地址 A, B, C, ...,Z 的必须键

**STO▶** 此键是用来贮存数值到内存地址中.

**X,T,☉,n** 这个按键是单独使用来使 X 值输入更加方便.

比方说我们要告诉计算器  $A = 16$ . 我们会让计算器在内存位置 A 贮存数值 16.

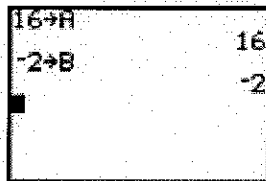
按键顺序: 16 **STO▶** **ALPHA** [A] **ENTER**



窗口显示:

同样, 我们可以键入下面的按键来使  $B = -2$

**(←) 2** **STO▶** **ALPHA** [B] **ENTER**



## Storing Variables:

Locate the following keys:

**ALPHA** This green key is required whenever you want to access memory locations A, B, C, ..., Z

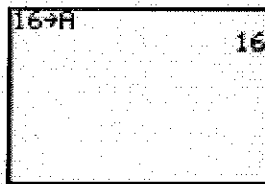
**STO▶** This key is needed to store a value in a particular memory location.

**X,T,θ,n** This key is used alone to enter X easily.

Suppose we want to tell the calculator that  $A = 16$ . Instead we will tell it to store the number 16 in memory location A which is found above the MATH key.

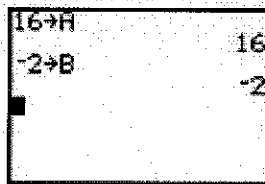
**KEY SEQUENCE:** 16 **STO▶** **ALPHA** [A] **ENTER**

**WINDOW DISPLAY:**



Similarly, we can show that  $B = -2$  by entering

**(-)** 2 **STO▶** **ALPHA** [B] **ENTER**



因为  $A=16$  且  $B = -2$ , 我们可以计算  $5B - \frac{1}{4}A$ .

16→A	16
-2→B	-2
5B-1/4A	-14

给 X 赋值更加简单. 你连 ALPHA 键都不用. 只需告诉计算器  $x = -8.1$ ,

$(-)$  8  $\text{STO} \rightarrow$   $[X, T, \theta, n]$  [B]  $\text{ENTER}$

-8.1→X	-8.1
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可见

**研讨会参与者注意:** 我们在第一次代数课前使用这种计算机来分析代数表达式有助于我们将学习重点放在书写和应用代数表达式和方程上.

### 练习例子:

1. 利用 MODE 来改变显示模式, 显示  $4/7$  的小数点后面 4 位.
2. 改变 MODE 模式, 用浮点方式显示并计算  $4/7$  的值.
3. 用 MATH 目录来用分数方式显示并计算  $1.17/2.1$  的值.
4. 计算  $7.23x - 23.62y^2$  当  $x = 3.1$  且  $y = -5.2$ , 写下窗口显示.

5. 计算  $\frac{3x-7.1}{5-4x}$  当  $x = .0004$ , 并写下窗口显示.

6. 计算  $|x^2 - y^2|$  当  $x = 36$  且  $y = 48$ , 并写下窗口显示.

Since  $A=16$  and  $B = -2$ , we can evaluate  $5B - \frac{1}{4}A$ .

16→A	16
-2→B	-2
5B-1/4A	-14

It is even easier to store a number in X. You **don't** need to use the ALPHA key. To tell the calculator that  $x = -8.1$ , press

$(-)$  8  $\text{STO} \rightarrow$   $[X,T,\theta,n]$   $[B]$   $\text{ENTER}$

-8.1→X	-8.1
--------	------

You see

**Note to workshop participants:** We use this calculator to evaluate algebraic expression early in our first algebra course so that we can focus on writing and using algebraic expressions and equations.

### SAMPLE EXERCISES:

1. Change the MODE setting to show 4 decimal places and compute the value of  $4/7$ .
2. Change the MODE setting back to **float** and again compute the value of  $4/7$ .
3. Use the MATH menu to divide and change  $1.17/2.1$  to a **fraction**.
4. Evaluate  $7.23x - 23.62y^2$  when  $x = 3.1$  and  $y = -5.2$ , and write the window display.

5. Evaluate  $\frac{3x-7.1}{5-4x}$  when  $x = .0004$ , and write the window display.

6. Evaluate  $|x^2 - y^2|$  when  $x = 36$  and  $y = 48$ , and write the window display.