Introduction to the TI-84 Plus CE

TI PROFESSIONAL DEVELOPMENT

Activity Overview

This activity provides an introduction to the basic features of the TI-84 Plus family of graphing calculators.

Concepts

- Order of operations
- Scrolling history
- Patterns
- Home screen
- Shortcut keys

Materials

- TI-84 Plus CE graphing calculator

Introduction to the Keys

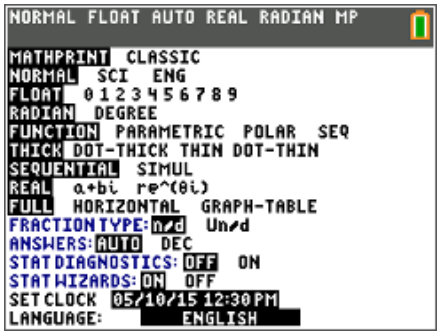
1. This activity begins with an introduction to some basic keys on the TI-84 Plus graphing calculator. Simply look at the face of the calculator and locate:

   [on] [enter] [mode] [2nd] [clear] [(-)] [+] [−] [×] [÷] [^] [x²] [X,T,θ,n] [apps]

2. Press [mode] . Make sure all items on the left are highlighted.

   - The default settings are shown.

   You can also press [2nd][mem] 7:Reset.. 2:Defaults… 2:Reset to restore the calculator to the default settings it has when it comes out of the box.



MathPrint™ and Classic Modes.

3. MathPrint™ and Classic modes contain the same functions, except **MathPrint** mode provides additional matrix shortcuts from the F3 soft key. Also in MathPrint, most inputs and outputs on the home screen and in the Y= editor are displayed as shown in textbooks, such as $\frac{1}{2}+\frac{3}{4}$ and $\sum_{k=1}^{100} kx^2$.

Classic mode displays expressions and answers as if written on one line, such as `1/2+3/4` or `Σ(KX^2,K,1,100)`.

Note: If you switch between these modes, most entries typed on the home screen will be preserved; however matrix calculations will not be preserved unless you store them. Think of them as images drawn on the screen.

n/d U n/d - selection of fraction output as improper or mixed numbers.

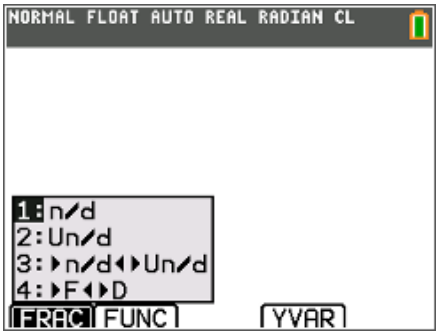
Answers

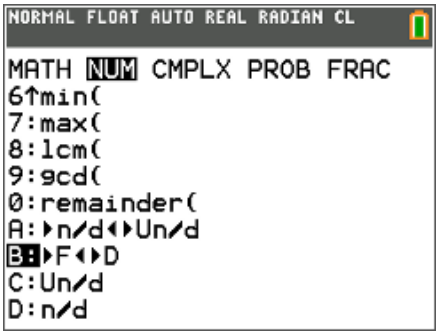
- **Auto** displays answers in a similar format as the input. For example, if a fraction is entered in an expression, the answer will be in fraction form, if possible.
- **Dec** displays answers as integers or decimal numbers.

The **ANSWERS** mode setting also affects how values in sequences, lists, and tables are displayed.

If any decimal point appears in the expression, then the output is a decimal. This is a quick way to force decimal output in **AUTO** mode.

You can also convert values from decimal to fraction or fraction to decimal using the **FRAC** shortcut menu or the MATH NUM menu.





STAT DIAGNOSTICS: OFF ON - Quickly select the existing option of displaying *r* and r^2 when calculating statistical regressions. This is a shortcut to an existing feature (only found in the catalog under `DiagnosticOn` or `DiagnosticOff`) which is placed here for ease of use.

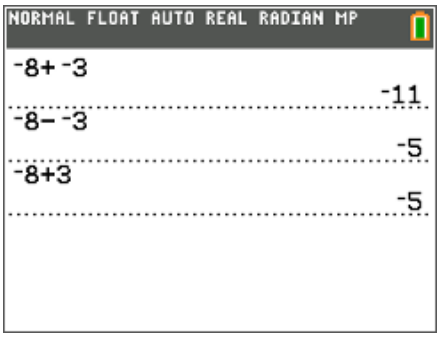
STAT WIZARDS: ON OFF – Walks you through setting up regression equations.

SET CLOCK appears near the bottom of this screen.

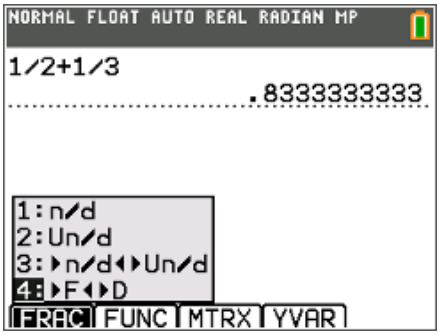
LANGUAGE: Use the [▸][◂] to select the desired language.

4. Press [2nd][quit] to return to the Home Screen ("Quit and Go Home") and try three problems shown below. Press [enter] after each command. Note the difference in appearance on the screen between [(-)] for negation and [−] for subtraction.

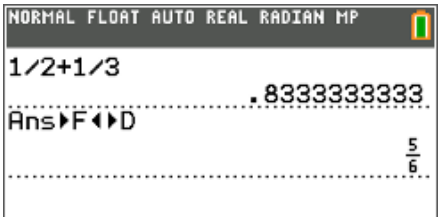
   ⁻8 + ⁻3 ⁻8 − ⁻3 ⁻8 + 3



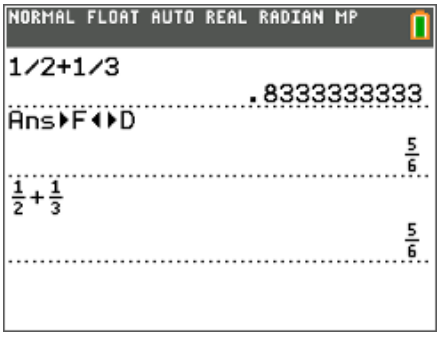
5. Press [clear]. Enter the sum $\frac{1}{2}+\frac{1}{3}$ using the [÷] key.



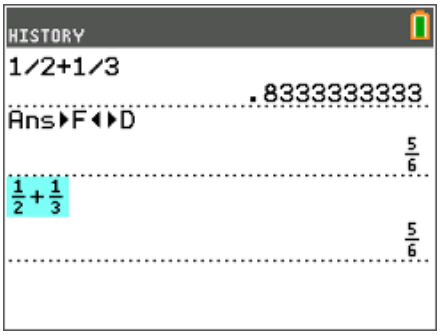
- Press [alpha] [f1] to access the Fraction shortcut menu. Select ▸F◂▸D to convert a decimal to a fraction or vice versa.
- You can also press [math] [1] ▸Frac to "frac" a decimal expression.



- Press [alpha] [f1] to use n/d to enter $\frac{1}{2}+\frac{1}{3}$ as stacked fractions. Press [enter].



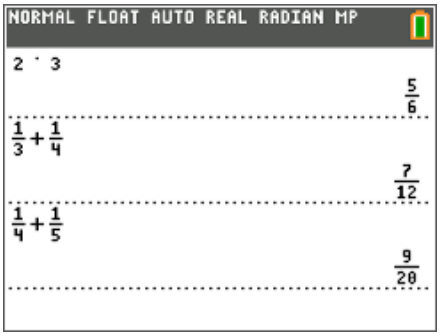
- Press [▲] to climb the stack to highlight the entry $\frac{1}{2}+\frac{1}{3}$. Press [enter] to bring this to the entry line.



- Use the arrow keys to edit it the expression. $\frac{1}{3}+\frac{1}{4}$.

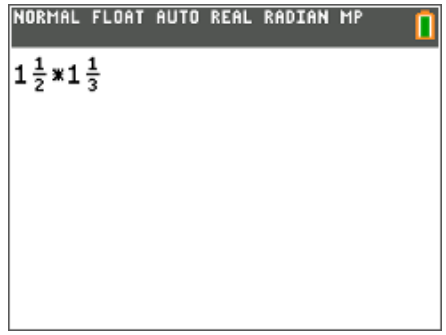
Tip: Press [2nd] [◂] to move to the beginning of the entry line and [2nd] [▸] to move to the end.

- Press [enter]. Continue the pattern. Predict the next value. Will it work for $\frac{1}{20}+\frac{1}{21}$?



Discuss: What patterns do you notice? Will it always work? Justify with algebraic reasoning.

6. Press alpha [f1] and use Und and scrolling history to create these expressions on your home screen.



$1\frac{1}{2}\cdot 1\frac{1}{3}$

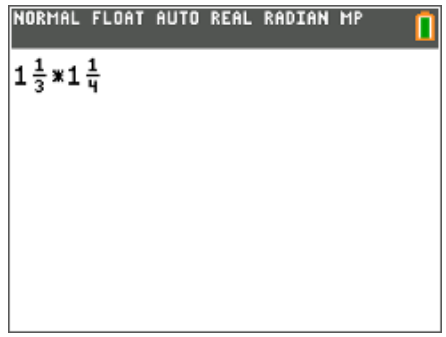
$1\frac{1}{2}\cdot 1\frac{1}{3}\cdot 1\frac{1}{4}\cdot 1\frac{1}{5}$

$1\frac{1}{2}\cdot 1\frac{1}{3}\cdot 1\frac{1}{4}\cdot 1\frac{1}{5}\cdot 1\frac{1}{6}\cdot 1\frac{1}{7}$

Tip: Follow the guiding arrows in the math template. For example, you press the right arrow key to reach the numerator, not the up arrow key.

Predict the next term. Explain what is happening.

7. Create these expressions on your home screen. Use Und.



$1\frac{1}{3}\cdot 1\frac{1}{4}$

$1\frac{1}{5}\cdot 1\frac{1}{6}$

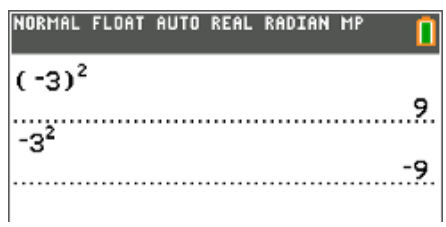
$1\frac{1}{7}\cdot 1\frac{1}{8}$

Predict the next term.

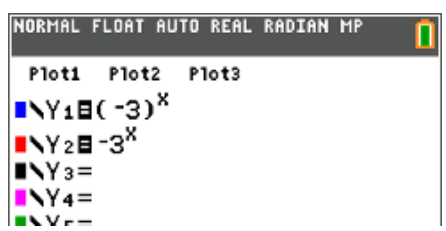
Will it work for $1\frac{1}{99}\cdot 1\frac{1}{100}$? Explain what is happening

8. Create these expressions on your home screen.

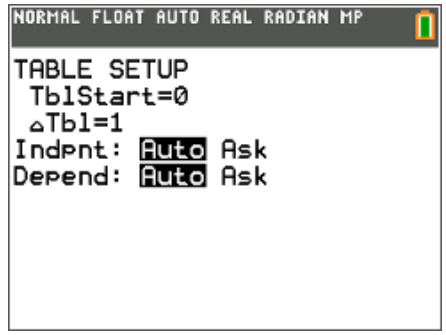
Use properties of exponents to explain what is happening.



- Press y= and enter these expressions in the Y= Editor.

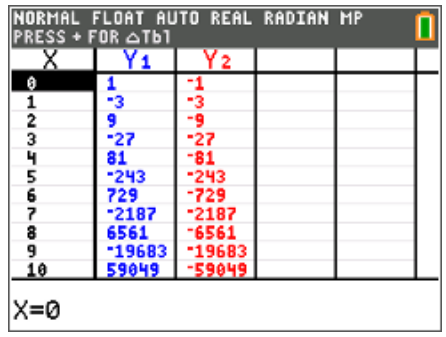


- Press [2nd][tblset] to start your table at 0 and increase in steps of 1.
- Press [2nd][table] to observe the table.

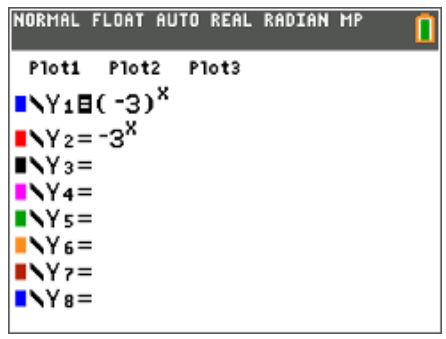


For what value(s) of *x* are these expressions equal?

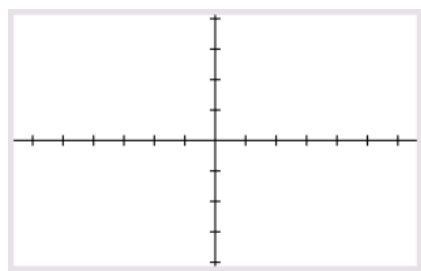
Why?



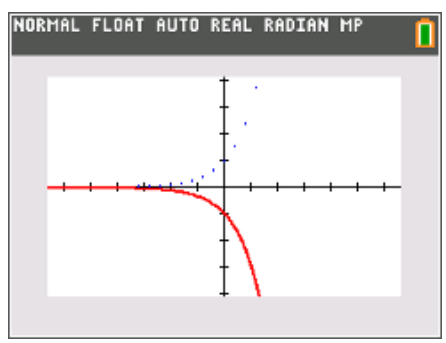
- Press [y=]. Arrow over the = for Y2 and press [enter] to turn the second equation off.
- Press [zoom] and select 4:ZDecimal.
- Press [graph].



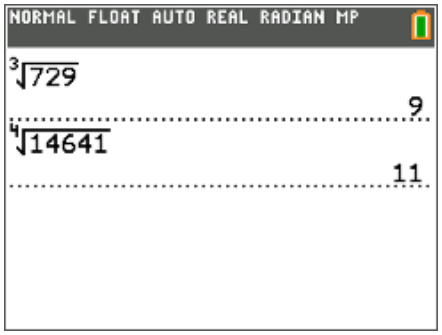
Sketch the graph of $Y_1=(-3)^x$?
Explain the graph's behavior and appearance.



- Press [y=]. Turn Y2 back on.
- Press [graph] to observe both graphs at once.
- Explain the differences in the graphs.



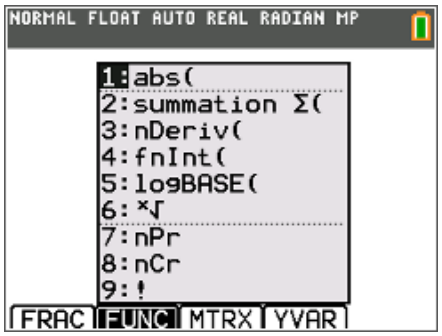
9. Find the following roots.



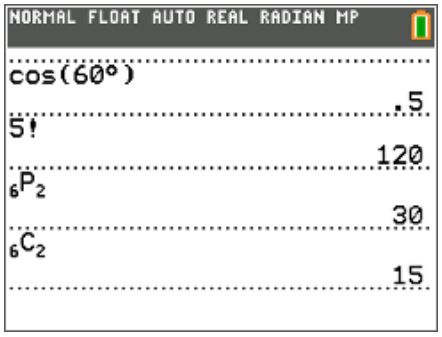
$\sqrt[3]{729}$ Press math 4: ∛(7 2 9 enter

$\sqrt[4]{14641}$ Press 4 math 5: ˣ√ 1 4 6 4 1 enter

10. Various other functions follow:



$|-4|$ Use shortcut menu to press alpha [f2] or press math Num 1:abs(



$\cos(60^\circ)$ Press cos 6 0 2nd [angle] 1:°)

(Makes no difference if in degree or radian mode)

5! Press 5 math Prob 4:!

${}_6P_2$ Press 6 math Prob 2:nPr 2

${}_6C_2$ Press 6 math Prob 3:nCr 2

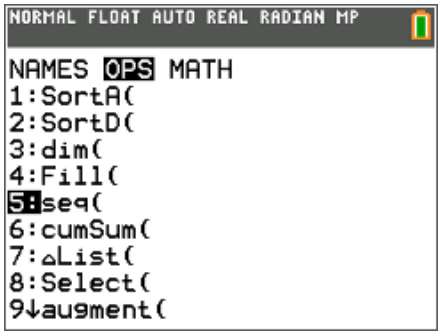
${}_6P_2$ is a permutation. For example, how many possible ways can there be a President and Vice President elected out of a club of six members? If the six members are A, B, C, D, E, and F, then AB is a different outcome than BA. All outcomes are:

AB, AC, AD, AE, AF, BA, BC, DD, BE, BF,
CA, CB, CD, CE, CF, DA, DB, DC, DE, DF,
EA, EB, EC, ED, EF, FA, FB, FC, FD, DE

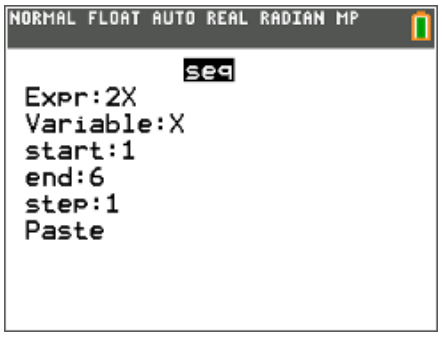
${}_6C_2$ is a combination. For example, how many possible ways can there be a two member subcommittee chosen from the above club of six members? Then AB is no different than BA, since that represents the same subcommittee. So there would be fewer outcomes than for ${}_6P_2$ – in fact, in this case, half as many.

11. Create the sequence {2, 4, 6, 8, 10, 12}.

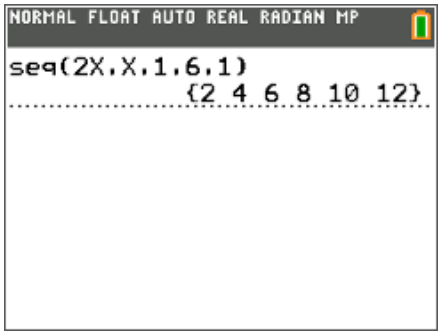
- Press [2nd][list] OPS 5: seq(



- Fill in the values, highlight Paste, and press [enter] to paste the command to the home screen.



- Once the command is on the home screen, press [enter].



12. With the TI-84 Plus CE in Normal mode, enter the following:

2×10^4

2.5×10^4

2×10^{-4}

2.5×10^{-4}

13. With the TI-84 Plus CE in Scientific mode, enter the following:

275000000

0.0000025

200×10^6