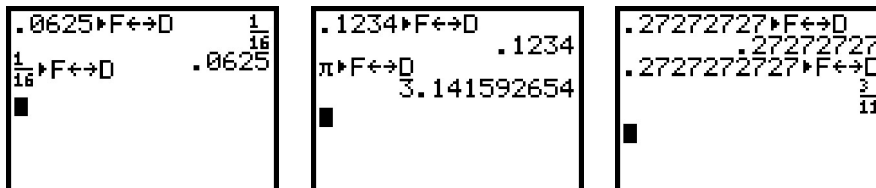


CHAPTER 0 Calculator Notes for the TI-73

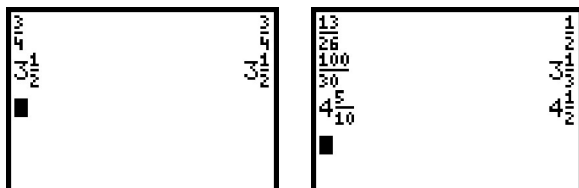
Note 0A • Fractions

This calculator has four special keys to facilitate work with fractions. Press **[MODE]** and make sure that all the entries in the left column are selected. (See **Note 1A** for an explanation of the mode options.)

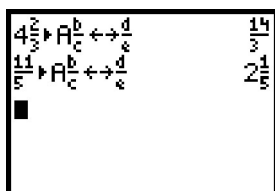
- a. **[F \leftrightarrow D]** converts fractions to decimal numbers and vice versa. A decimal number (either terminal or repeating) that has a fraction equivalent with a denominator of less than 5 digits will convert. If the number is a repeating decimal number, be sure to enter about 10 digits of the pattern.



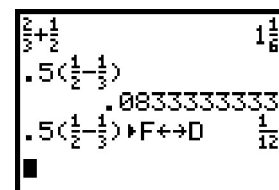
- b. **[UNIT]** and **[b/c]** are used to enter a number either as a fraction or as a mixed number. **[UNIT]** displays the whole-number part and **[b/c]** displays the fraction part. To enter $\frac{3}{4}$, press **[3] [b/c] [4] [ENTER]**. To enter $3\frac{1}{2}$, press **[3] [UNIT] [1] [b/c] [2] [ENTER]**. Fractions are automatically displayed in reduced form. (If you don't want fractions to be automatically reduced see **Note 1A**.)



- c. **[A $\frac{b}{c}$ \leftrightarrow $\frac{d}{e}$]** converts mixed numbers to improper fractions and vice versa.



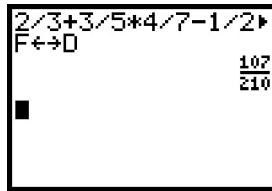
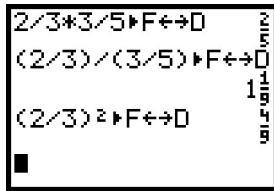
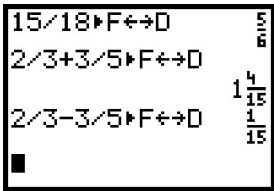
To enter and solve the problem $\frac{2}{3} + \frac{1}{2}$, press **[2] [b/c] [3] [+] [1] [b/c] [2] [ENTER]**. The answer to a problem that involves only numbers entered as fractions will be in the form of a fraction or a whole number. However, the answer to a problem that involves a number entered as a decimal will be in decimal form. You may then press **[F \leftrightarrow D]** to either convert the decimal answer to a fraction or the fraction answer to a decimal number.



The division sign and the fraction bar are the same key on this calculator. As an alternative to using the special fraction keys, you can enter a fraction as a division problem. To work with simple fractions like $\frac{4}{7}$ and improper fractions like $\frac{7}{4}$, simply enter them into your calculator as division problems. To see the

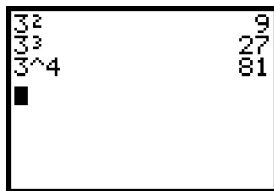
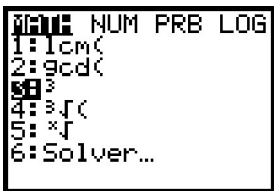
(continued)

answer displayed as a fraction, you must press $\boxed{F\leftrightarrow D}$. Often you don't need to use parentheses around a fraction entered as a division, but when in doubt, put in the parentheses.

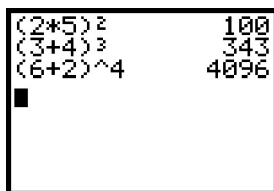
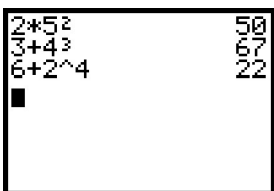


Note 0B • Exponents

There are several ways to raise a number to a power by using the calculator. The simplest way to square a number (raise it to the second power) is to use the $\boxed{x^2}$ key. Enter the number you want to square and then press $\boxed{x^2}$. When you press $\boxed{\text{ENTER}}$, the calculator will multiply the number by itself. You can calculate x^3 by entering a number and then pressing $\boxed{\text{MATH}} \boxed{3} \boxed{\text{ENTER}}$. For all powers (including the second and third powers if you wish), you can use the $\boxed{\wedge}$ key.

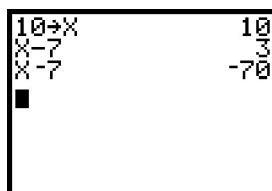
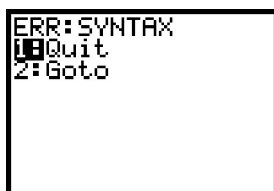


Order of operations requires that you do operations within parentheses first, evaluate all powers second, multiply and divide from left to right third, and add and subtract from left to right last.



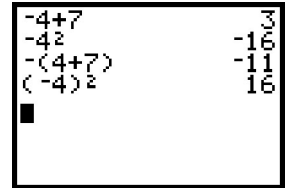
Note 0C • Negation and Subtraction

Negation and subtraction are each performed with a different key on this calculator. Negation, the $\boxed{-}$ key, changes the sign of a number or a variable. It is slightly higher and shorter than the subtraction symbol. If you enter the wrong symbol, either you will get an error message, or you will get an unexpected result.



(continued)

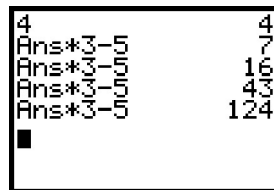
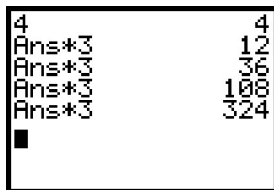
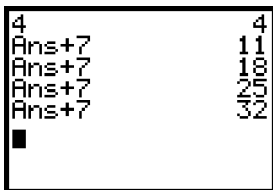
In the order of operations, negation is treated like “multiply by negative one,” so it is performed before addition and subtraction but after evaluation of powers. Sometimes you may need to use parentheses to get the correct result.



Note 0D • Recursion

The ANS command on the calculator allows you to use the result of your last calculation in your next calculation. If you press **ENTER** without pressing another key, the calculator will repeat the last operation on the previous result. Combining these two features allows you to perform on-screen recursion, calculating a new number by repeating the operation using the result of the previous calculation. You can create patterns of numbers (sequences) using the following procedure:

- Enter the starting number of your sequence and press **ENTER**.
- Enter an expression using **Ans**. You can get **Ans** by pressing any of the operation keys, such as **+**, **-**, **×**, **÷**, **^**, **x²**, or by pressing **2nd** **[ANS]**.
- Press **ENTER** **ENTER** **ENTER** and so on. Each time you press **ENTER**, you will get one more term in the sequence.



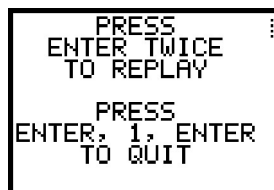
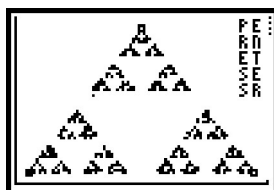
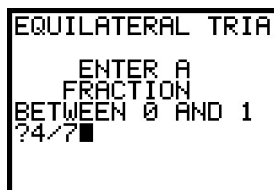
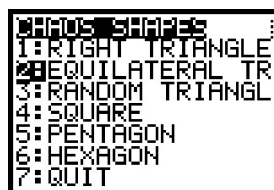
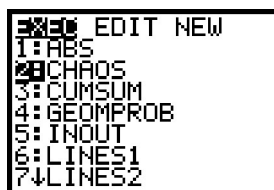
Note 0E • The Chaos Game

To play the Chaos game, follow these steps:

- Link or manually enter the program into your calculator. (See **Note 0F** and **Note 0G**.)
- Press **PRGM** and make sure the word **EXEC** is highlighted. Find the program labeled **CHAOS**. Press its number or use the down arrow to select the program and press **ENTER**. To execute the program press **ENTER** again.
- You are asked to choose a Chaos shape. Press the appropriate number or arrow down and press **ENTER** to select the shape.
- You are then asked to enter a fraction between 0 and 1. You can enter this value as either a fraction or a decimal number. Press **ENTER**.
- The calculator will plot 1000 points by following the Chaos rules to plot a fractal. When the program is done, press **ENTER**.

(continued)

f. Follow the directions to replay or to quit.



```

PROGRAM:CHAOS
ClrScreen
Menu("CHAOS
  SHAPES", "RIGHT
TRIANGLE", 1, "EQUILATERAL
TRI", 2, "RANDOM
TRIANGL", 3, "SQUARE", 4,
  "PENTAGON", 5,
"HEXAGON", 6, "QUIT", 8)
Lbl 1
Disp "RIGHT TRIANGLE"
(.05,.95,.05)→L1
(.05,.05,.65)→L2
Goto 7
Lbl 2
Disp "EQUILATERAL TRIA"
(.05,.95,.5)→L1
(.05,.05,.65)→L2
Goto 7
Lbl 3
Disp "RANDOM TRIANGLE"
(rand ,rand ,rand )→L1
.7(rand ,rand ,rand )→L2
Goto 7
Lbl 4
Disp "    SQUARE"
(.2,.8,.8,.2)→L1
(.05,.05,.65,.65)→L2
Goto 7
Lbl 5
Disp "    PENTAGON"
.5+.35sin((0,1,2,3,4)72°)
→L1
.35+.35cos((0,1,2,3,4)
72°)→L2
Goto 7
Lbl 6
Disp "    HEXAGON"
.5+.35sin((0,1,2,3,4,5)
60°)→L1
.35+.35cos((0,1,2,3,4,5)
60°)→L2
Lbl 7
ClrDraw:FnoFF
PlotsOff
0→Xmin:1Xmax
0→Ymin:.7Ymax
Plot1(xyLine,L1,L2,*)
L1(1)X:L2(1)→Y
dim(L1)→N
Disp "", "    ENTER A"
Disp "    FRACTION"
Disp "BETWEEN 0 AND 1"
Input F
For(J,1,1000)
int(Nrand +1)P
X+(L1(P)-X)F→X
Y+(L2(P)-Y)F→Y
Pt-On(X,Y)
End
Text(0,84,"P E"
Text(6,84,"R N"
Text(12,84,"E T"
Text(18,84,"S E"
Text(24,84,"S R"
Pause
Lbl 8
PlotsOff
Disp "    PRESS", "
ENTER TWICE", "
TO REPLAY", "", "
PRESS", "ENTER,
1, ENTER", "    TO
QUIT"
Pause

```

Note 0F • Linking Programs or Lists

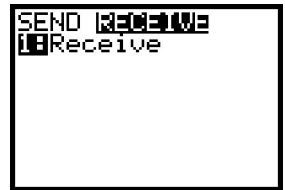
To transfer a program or list from one calculator to another, follow these steps:

- Connect two calculators using a link cable. Be sure that the connection is tight on each unit.
- Turn on both calculators, and on each one press **APPS** and select 1:Link...

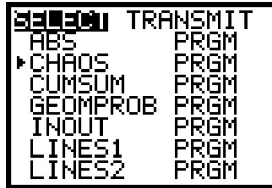


(continued)

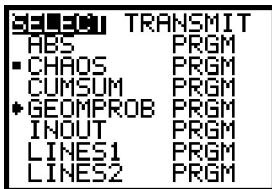
- c. On the **receiving calculator**, arrow to RECEIVE and press **ENTER** so that the calculator displays Waiting....



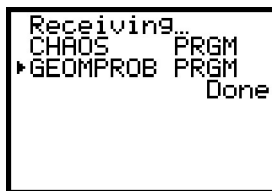
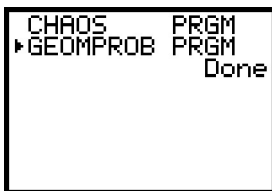
- d. On the **sending calculator**, select 2:SelectAll-.... To link a program, arrow down to the name of the program you want to send. To link data, arrow down to the list you want to send.



- e. Press **ENTER** to select a program or list. (You can select more than one program and/or list and send them simultaneously. Just continue to arrow down pressing **ENTER** at each program or list you want to transfer.) Then arrow right to TRANSMIT and press **ENTER**.

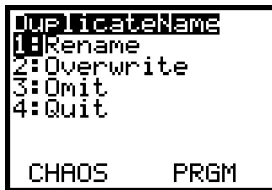


- f. When the transfer is complete, the name of the program or list transferred will show on the screens of both the sending and receiving calculators.



Errors

If you get Error in Xmit, check that the link cable is pushed all the way in each calculator and try again. Remember that after you arrow to the program or list you want to send, you must press **ENTER** to select it before you arrow to TRANSMIT. The receiving calculator must be Waiting before the sending calculator transmits. If the receiving calculator already has a program or list by the same name as the one you are sending, the receiving calculator will show a DuplicateName menu. Select 1:Rename or 2:Overwrite from this menu. If you choose to rename, you must enter a new program name. (See Note 0G, step b.)



Note 0G • Entering a Program

Your calculator is like a small computer. You can instruct (or program) it to do calculations or to communicate with other devices. What follows are not instructions on how to write a program—they are instructions on how to enter a calculator program that has already been written. You must be very careful to enter the commands exactly as they are written. Changing the program in any way will alter how it runs or may cause an error.

There are three ways to enter a program into your calculator. Two easy ways are to download the program from either a computer or another calculator. To use a computer, download the program from a CD or website directly into your calculator by using TI Connect™ software. You will need the proper cable to link your computer to your calculator. To use another calculator that has the program in its memory, link the two calculators with a link cable and transfer the program. (See **Note 0F**.) The third way is to enter a program manually by following these steps:

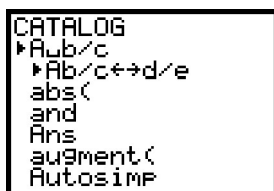
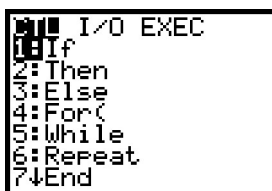
- a. Press **PRGM** and arrow to NEW.



- b. Press **ENTER** and the name of the program. To name the program, press **2nd** **[TEXT]** and select each letter (or number) followed by **ENTER**. When the name is complete, select DONE and press **ENTER** twice.



- c. Enter the program exactly as you see it. Lowercase letters in the command indicate that you must find the command on the calculator. You can find many programming commands by pressing **PRGM** and looking under CTL and I/O. To find other commands, functions, and symbols, look in the menu of the appropriate calculator key. Or you can also press **2nd** **[CATALOG]** and arrow to the entry you want and press **ENTER**. If you enter a command from the calculator text screen, the letters will be all uppercase. The command won't look the same as how it's been written, and it won't work.



(continued)

- d. Use **2nd** [INS] **ENTER** to insert a new line between two lines. Use **DEL** on a blank line to delete that line.
- e. Press **2nd** [QUIT] when you finish entering the program.

Errors

You can edit the program if there is an error or if you need to make a change.

- a. Press **PRGM** and arrow to EDIT. Arrow down to the program name and press **ENTER**.
- b. Scroll down through the program to find the error. Studying the entire program on paper is often easier than working from the calculator screen where you can only see a small portion at one time. Use **2nd** [INS] or **DEL** as needed to make changes.
- c. If, when you execute a program, you get an error message that has the Goto option, choose this option. The calculator will automatically switch to EDIT mode and scroll to the line with the error. Then proceed as in **step b**.

```
EXEC [000] NEW
1:ABS
2:CHAOS
3:CUMSUM
4:GEOMPROB
5:INOUT
6:LINES1
7↓LINES2
```

```
ERR:SYNTAX
1:Quit
2:Goto
```

Note 0H • Generating Random Integers

You can generate random integers within an interval using the `randInt` command. Press **MATH**, arrow to PRB, and select 2:randInt(to access the `randInt` command.

To randomly generate integers between 1 and 3 inclusive, enter `randInt(1,3)`. Pressing **ENTER** repeatedly will generate as many of these integers as you like.

To randomly generate a particular number of integers in an interval—for example, four integers between 1 and 3—enter `randInt(1,3,4)`.

```
randInt(1,3)
randInt(1,3)
randInt(1,3)
randInt(1,3)
randInt(1,3)
```

```
randInt(1,3,4)
{1 3 1 2}
```