User's Guide

# C4 Finance

## Financial Calculator

**for the Palm OS™**

www.c4calc.com

## Notice

This guide and any examples contained herein are provided “as is” and subject to change without notice. C4Finance developers make no warranty of any kind with regard to this guide, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. C4Finance developers shall not be liable for any errors or for incidental or consequential damages in connection with using of this manual or the examples contained herein.

All right reserved. Adaptation or translation of this manual could be done without prior written permission of C4Finance developers with notice author/authors name in the following form “Adapted by …” or “Translated by…”. This notice must be placed at this page in the box below “Edition”. C4Finance developers do not take any responsibilities for adapted or translated content of this User’s Guide.

**Dmitri Vokhmine**
**Box 7360,**
**Perm,**
**Russia, 614083**

**E-mail: c4@perm.raid.ru**

| Edition | October, 2003 |
| --- | --- |
| | |

Palm OS, Palm™ handheld, Palm Powered™ handheld and Graffiti are registered trademarks of Palm, Inc.

# Contents


**WELCOME TO C4 FINANCE. ..... 6**

**GETTING STARTED ..... 7**

SYSTEM REQUIREMENTS ..... 7
INSTALLING C4FINANCE ..... 7
UNINSTALLING C4FINANCE. ..... 7
EDIT FIELD. ..... 8
EDITING. ..... 8
CALCULATIONS. ..... 10
*Binary, hexadecimal and octal numbers. ..... 11*
*The percent key. ..... 11*
*Apostrophe as thousand separator. Why? ..... 11*
MULTIPLE EDIT FIELD. ..... 12
CATEGORY MENU AND FUNCTION PAD. ..... 13
VARIABLES. ..... 14
GENERAL RULES FOR WORKSHEETS. ..... 14

**CALCULATION LOG. ..... 16**

**CUSTOMIZING THE SOFTWARE ..... 17**

**FINANCIAL CALCULATIONS. ..... 20**

TIME VALUE OF MONEY. ..... 20
*Time Value of Money worksheet. ..... 21*
*Create new Time Value of Money list. ..... 21*
*Load existing worksheet. ..... 22*
*Calculations. ..... 22*
*Amortization table. ..... 22*
*Examples. ..... 24*
CASH FLOW CALCULATIONS. ..... 26
*Cash Flow worksheet. ..... 27*
*Creating a Cash Flow list. ..... 27*
*Load existing worksheet. ..... 28*
*Calculations. ..... 28*
*Entering Cash Flows. ..... 28*
*Examples. ..... 28*
BOND. ..... 32
*Bond worksheet. ..... 32*
*Calculations. ..... 32*
*Examples. ..... 33*
DEPRECIATION. ..... 36
*Depreciation worksheet. ..... 36*
*Calculations ..... 37*
*Examples ..... 37*
INTEREST RATE CONVERSION. ..... 42
*Interest rate conversion worksheet. ..... 42*
*Calculations. ..... 42*
*Example. ..... 42*
BREAKEVEN. ..... 44
*Breakeven worksheet. ..... 44*
*Calculations. ..... 44*
*Example. ..... 44*
BLACK-SCHOLES. ..... 46
*Black-Scholes worksheet. ..... 46*
*Calculations. ..... 46*
*Example. ..... 47*
CURRENCY CONVERTER. ..... 48
*Currency converter worksheet. ..... 48*

*Calculations.* ..... *48*
*Example.* ..... *48*
ACTUARIAL FUNCTIONS ..... 50
*Single Payment Present Value.* ..... *50*
*Single Payment Future Value.* ..... *50*
*Uniform Series Present Value.* ..... *50*
*Uniform Series Future Value.* ..... *51*

**BUSINESS CALCULATIONS.** ..... **52**

**STATISTICS CALCULATIONS.** ..... **55**

STATISTICS. ..... 55
*Statistics worksheet.* ..... *56*
*Create new Statistics list.* ..... *56*
*Load existing worksheet.* ..... *57*
*Calculations.* ..... *57*
*Regression models and analysis.* ..... *57*
*Examples.* ..... *57*
*Distribution functions.* ..... *60*

**BOOLEAN OPERATORS.** ..... **66**

**TIME CALCULATIONS.** ..... **67**

*Time worksheet.* ..... *67*
*Calculations.* ..... *67*
*Order of calculations.* ..... *68*
*Examples.* ..... *69*

**EQUATION SOLVER.** ..... **75**

*Equation Solver worksheet.* ..... *75*
*Calculations.* ..... *77*
*How Equation Solver works. Limitations.* ..... *77*
*Examples.* ..... *80*

**GRAPHS.** ..... **86**

*Graphs worksheet.* ..... *86*
*Calculations.* ..... *86*

**TRIGONOMETRY.** ..... **87**

**REGISTRATION AND UNLOCKING YOUR COPY OF C4.** ..... **89**

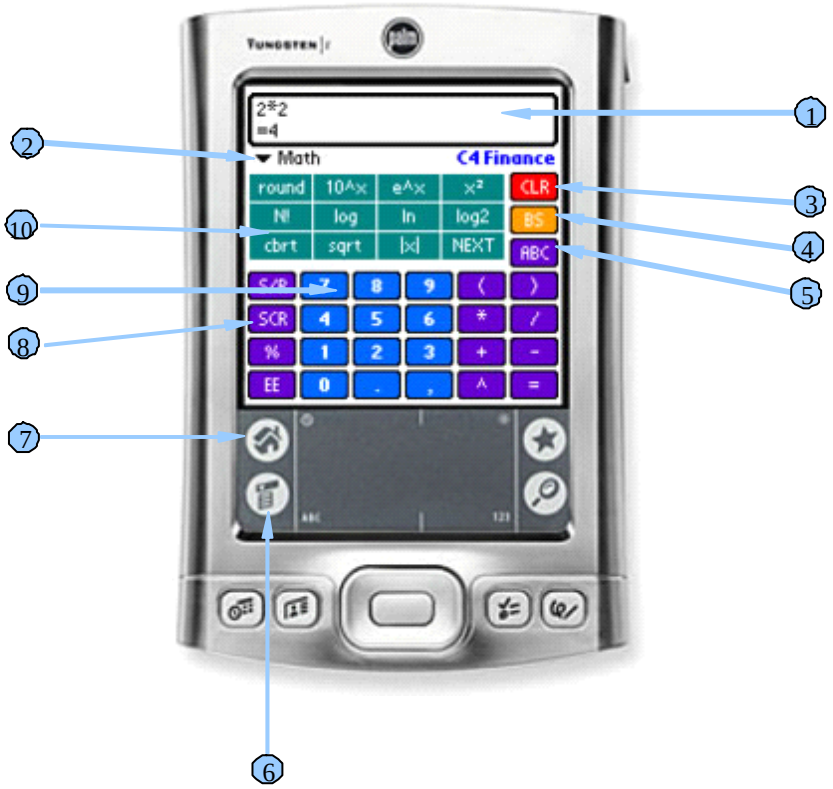
**CONTACTING C4FINANCE DEVELOPERS.** ..... **91**

**CREDITS.** ..... **91**

**SPECIAL THANKS.** ..... **91**

**PURCHASING C4.** ..... **91**

**INDEX** ..... **92**




1. Edit Field
2. Category menu
3. Clear Edit Field.
4. Backspace
5. Switch to alphabetic layout
6. Application menu
7. Application exit
8. Change Edit Field.
9. Number pad
10. Function pad

For undo operation open the menu bar "⟋" and tap ◀◀ for undo or ▶▶ for redo

To view calculation log, open the menu bar "⟋" and tap "LOG"

# Welcome to C4 Finance.

C4 Finance is a new generation calculator for Palm® Computing platform with the following features.

- Multi-line edit field with standard text editor convenience.
- With the multiple edit fields you can work with several problems simultaneously.
- Calculation Log let you choose previous problems and helps organize your calculations.
- Undo and Redo button provides easier editing process.
- Category menu and Function pad let you use any of the Built-in functions and worksheets almost instantly.
- Store / Recall worksheets allow viewing, editing and saving your task variables.
- Hexadecimal, octal and binary numbers calculations.
- Boolean operators comprehensive support, including “xor” and “not”.
- Build-in quick reference includes comprehensive description and examples for each function.
- Built-in worksheets solve the following tasks:
  - **Time Value of Money**.
  - **Cash Flow**.
  - **Interest Conversions**.
  - **Bonds**.
  - **Depreciation**.
  - **Breakeven**.
  - **Black-Scholes**, European options and other derivatives calculations (for assets paying/non-paying dividend), Delta, Gamma, Theta, Vega, Rho, D1, D2.
  - **Forex,** currency converting.
  - **Statistics**. Mean, correlation coefficient, 6 regression models for two variables.
  - **Time**. Timeline calculations.
  - **Equation Solver**. Type an equation and then solve for any unknown variable. No programming needed!
  - **Graphics Explorer**. Look up and explore functions. You can make reasonable guesses for equation solver.
  - **Graphs**. Organize your equations to view a few equations at once.

# Getting Started

## *System Requirements*

- Palm OS™ 4.1 and later; go to “Version” form in the application launcher (Menu button (next to Graffiti area)→App→Info… tap “Version” button. Palm OS version appears at the top of the screen)
- 590Kb memory. (Menu button (next to Graffiti area)→App→Info… tap “Size” button. Free memory value appears at the top of the screen)

If you have Palm OS™ 4.0 or lower, please check for support downloads.(http://www.palm.com go to “support downloads”) You can update your Palm OS for free (for Palm m500, m505); sometimes you have to pay (Palm III, Palm V).

In other cases, please, use C4 v1.19 (for Palm OS 3.1, 3.2, 3.3, 3.5) or v1.19se (for Palm OS 4.x). You can download this version from http://www.c4calc.com/downl.htm . Please, send your request after purchase, with HotSync name to get unlocking code for software activation.

## *Installing C4Finance*

Note: To install the application, the Palm Install Tool must be installed on your PC (Palm Install Tool is a part of Palm™ Desktop Organizer Software with your Palm connected organizer). We also recommend reading your Palm connected organizer manual.

1. Uninstall the previous version of C4, if it is installed.
2. Make sure that you have enough memory on your Palm to install C4Finance (see System Requirements).
3. Unzip C4Fin.zip file.
4. Double-click on C4Fin.prc file.
5. Double-click on MathLib.prc file (if you do not have it on your Palm).
6. Tap “Done” or “Exit” button, to close Palm Install Tool window.
7. Perform a HotSync (HotSync Manager must be running).

**Installation complete.**

or

- for black and white devices.

or

- for color devices.

Click the application icon to run it.

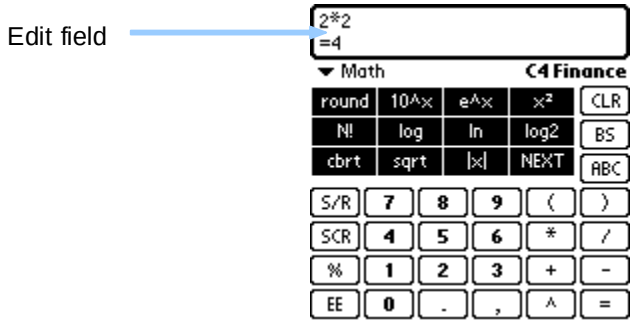
## *Uninstalling C4Finance.*

1. Go to “Delete” form in the application launcher (on your Palm). (Menu button (next to Graffiti area)→App→Delete…)
2. In the list choose “Finance” and tap “Delete…” button
3. Confirm deleting. Tap ”Yes”.
4. Tap “Done” to complete deleting and return to the application launcher.

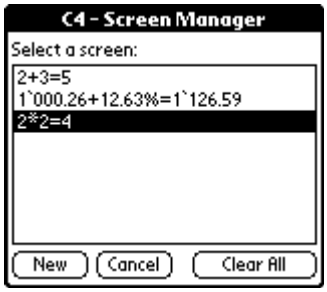
**C4Finance application is uninstalled.**

## *Edit field.*

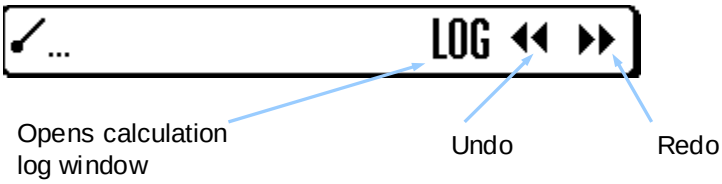
The edit field is the main part of the application where you can enter data and see the result.




In order to shift to other edit field tap “SCR” button. In the Screen Manager window tap the desired edit field to open it or create your own (tap “New” button).




You can undo or redo your last actions. In the main screen window open the menu bar “✓” and tap ◀◀ for undo or ▶▶ for redo.




## *Editing.*

Editing in C4Finance is simple and quite similar to editing in a regular text editor for the Palm OS ™ platform.

The following are standard editing examples.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| 1234+5678 | **1’234+5’678** | Enter data |
| “BS” | **1’234+567** | Backspace. |
| 9 | **1’234+5’679** | Enter a number |
| | **1’234+567** | Undo |
| | **1’234** | Undo |
| +5679 | **1’234+5’679** | Enter data |
| Move pen | **1’234+5’679** | Select |
| | **1’234+5** | Cut selected text to the clipboard |
| | **1’234+5’679** | Paste text from the clipboard |
| Move pen | **1’234+5’679** | Select 679 numbers |
| | **1’234+5’679** | Copy selected text |
| Tap the end of line | **1’234+5’679** | Move cursor |
| | **1’234+5’679’679** | Paste text from the clipboard |
| “CLR” | | Clear text |
| 25 | **25** | Enter data |
| “S/R”, tap “r0=…”, “=” | **25** | Stores 25 into r0 register |
| “S/R”, tap “r0=…”, “-” | **25** | Subtracts 25 from r0 register |
| “+”, “S/R”, tap “r0=0” | **25+r0** | Adds 25 and r0 register |
| “=” | **25+r0 =25** | |

## *Calculations.*

Below you can find a brief introduction to C4Finance arithmetic. Calculations in C4Finance resemble handwriting on a sheet of paper. Imagine that a magic sheet of paper understands your math writing and automatically solves it. That is the way C4Finance works.

In order to calculate 45.23 + 47.9:

| **Keys/Actions:** | **Display:** | **Description:** |
|---|---|---|
| “CLR”<br>45.23 + 47.9<br>“=” | **45.23 + 47.9**<br><br>**45.23 + 47.9**<br>**=93.13** | <br><br>End of the calculation. |

In order to perform an action with the just obtained result, you can continue entering data. In this case the left part of the previous calculation will disappear.

| **Keys/Actions:** | **Display:** | **Description:** |
|---|---|---|
| +123<br><br>“=” | **93.13+123**<br><br>**93.13+123**<br>**=216.13** | <br><br>End of the calculation. |

Another examples: $\sqrt{45}+5^2$

| **Keys/Actions:** | **Display:** | **Description:** |
|---|---|---|
| Tap category menu. | | Choose ‘Math’ category if necessary. |
| “CLR”<br>sqrt(<br>45 ) + 5 “^” 2<br><br>= | **sqrt(**<br><br>**sqrt(45)+5^2**<br><br>**sqrt(45)+5^2**<br>**=31.71** | Tap square root button<br><br><br><br>End of the calculation. |

### *Binary, hexadecimal and octal numbers.*

C4Finance understands the following prefixes for any numbers:

| | |
|---|---|
| **0x** (zero and x) | hexadecimal *(0xA5F, 0xB10)* |
| **0d** (zero and d or no prefix) | decimal *(123, 0d123)* |
| **0o** (zero and o) | octal *(0o346, 0o152)* |
| **0b** (zero and b) | binary *(0b10010011, 0b11100001)* |

Result shows in decimal format only.

### *The percent key.*

The % key has two functions: finding a percentage and adding or subtracting a percentage.

**Finding a Percentage.** In this case you use a '×' sign prior to the number; % divides the number by 100.

For example:
10 % = 0.1
200 *10 % = 20

**Adding or subtracting a percentage.** In this case you use plus or minus signs prior to the number. For example, to increase 200 by 10%, just enter 200 + 10% =. (Result is 220)

Tips calculations. Imagine you and your friend after dinner in a restaurant having gotten a bill of $45. All your expenses are equal. You have decided to pay 15% tip. How much should each of you pay? What is the clear tip amount?

| Keys/Actions: | Display: | Description: |
|---|---|---|
| "CLR" | | Lets clear the edit field. |
| 45 + 15 % = | **45+15% =51.75** | You and your friend have to pay $51.75 . |
| / 2 = | **51.75/2 =25.87** | Each of you have to pay $25.87 |
| "CLR" | | Clears the edit field |
| 45 * 15%= | **45*15% =6.75** | The clear 15% tip amount for $45 is $6.75 |

### *Apostrophe as thousand separator. Why?*

Why does C4Finance use the apostrophe as a thousands separator? (1'000'000 vs. 1,000,000?)

Because C4Finance allows entering functions in the edit field and these functions can have more than one argument.

Please look at an example: "hypot(2'000, 3'000)". If you change 2'000 and 3'000 to 2,000 and 3,000 , then you modify the expression to "hypot(2,000,3,000)". It is clear that by changing the expression there are now four arguments for "hypot" instead of two. Therefore, we have to use a symbol other than comma for

the thousands separator.

### *Multiple edit field.*

C4Finance maintains a multiple edit field scheme. It is as if you had a few calculators in your hands and were able to exchange data among them. For example, you can do some calculations on the first calculator then switch to the second calculator, make other necessary calculations then switch back to the first calculator and use the result from the second calculator. Now imagine 3, 10, or 16 calculators.

Below you can find an example of how to use two edit fields simultaneously.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| "CLR"<br>23.4+47.7= | **23.4+47.7<br>=71.1** | Do the first calculation. |
| "S/R", tap "r0=", then "=" | **23.4+47.7<br>=71.1** | Put result (71.1) to the r0 register. |
| Tap "SCR", then "New" | | Go to new empty edit field. |
| "S/R", tap "r0=71.1000", then +12.2 = | **r0+12.2<br>=83.3** | Do the second calculation. |
| "S/R", tap "r0=", then "+" | **r0+12.2<br>=83.3** | Put the second result in the r0 register. |
| "SCR", tap "23.4+47.7=71.1" | **23.4+47.7=71.1** | Go back to the previous calculations in the first edit field. |
| + "S/R", tap "r0=" | **71.1+r0<br>=225.5** | End of the calculation.<br><br>If you wish you could switch to some other edit field to do calculations and keep the data in this indicator as long as you want. |
| "SCR", then tap "Clear All" | **71.1+r0<br>=225.5** | Clear. Unused Edit fields all of the calculations except the currently active one. |

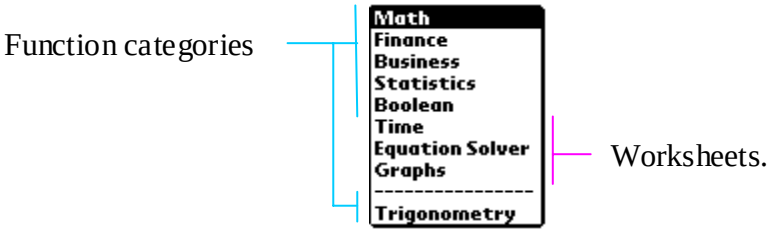
## *Category Menu and Function pad.*

C4Finance has two menus: application menu ( or ) and category menu. Look at page 6 for details.

By using the application menu you get access to editing functions (copy, cut and so on) and special functions (preferences, functions reference and so on).

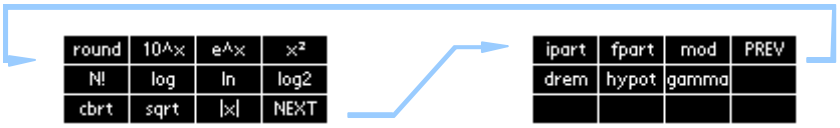
By using the category menu you get access to different function categories. For example: financial, business or math functions.

Let's take a look at this menu.




Choosing one of the function categories directly affects the Function pad appearance. Some of the items in the list (Time, Equation Solver and Variables) do not affect the Function pad, but will call corresponding forms (worksheets).

Here is the function pad example for the Math category.

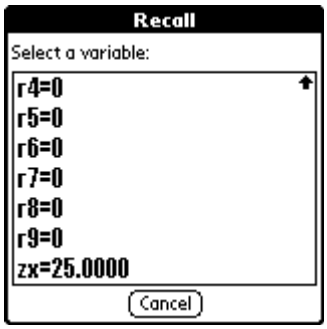



Use buttons NEXT ▸ and PREV ▸ to get the other functions of the same category.

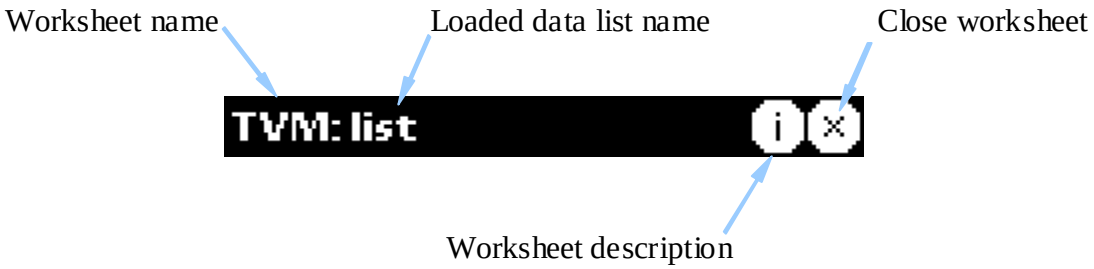
Buttons with capitalized letters are used to access worksheets, those with small letters to put the function name into the edit field.

## *Variables.*

C4Finance lets you use variables.

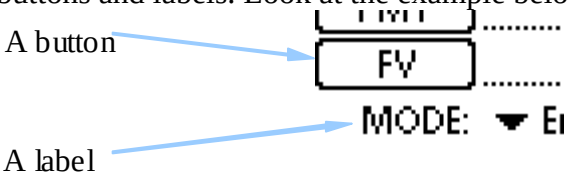
| Keys/Actions: | Display: | Description: |
|---|---|---|
| CLR<br>zx=25 | **zx**<br>**=25** | Enter variable “zx” and its value |
| = | | Variable is entered and ready to use. Empty field is ready to start new calculation. |
| zx+8= | **zx+8**<br>**=33** | Use stored variable. |
| “CLR”, then “SCR” |  | Clear edit field and open Recall window, scroll down the variable list. |
| Tap the zx=25.0000 | **zx** | Select “zx” to use it in the future calculations |
| +456= | **zx+456**<br>**=481** | Enter new number and finish the calculation |

## *General rules for worksheets.*

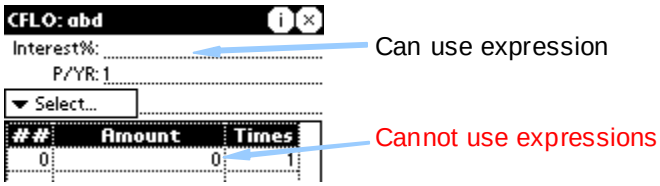



1. Each worksheet has a button “Close worksheet”. See example below.
2. All the worksheets have their names at the top of the window. Some of them have names of the loaded data lists after a colon.
3. Use available clipboard controls (at the menu bar) for any field of the active worksheet.
4. You can create new worksheets or load saved.

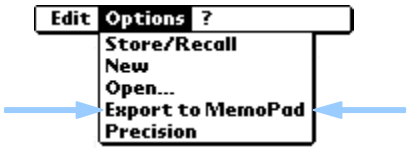
5. You can always distinguish buttons and labels. Look at the example below.




6. You <u>can</u> use numbers, expressions and variables in the fields of worksheets. You <u>cannot</u> use expressions in the table cells.

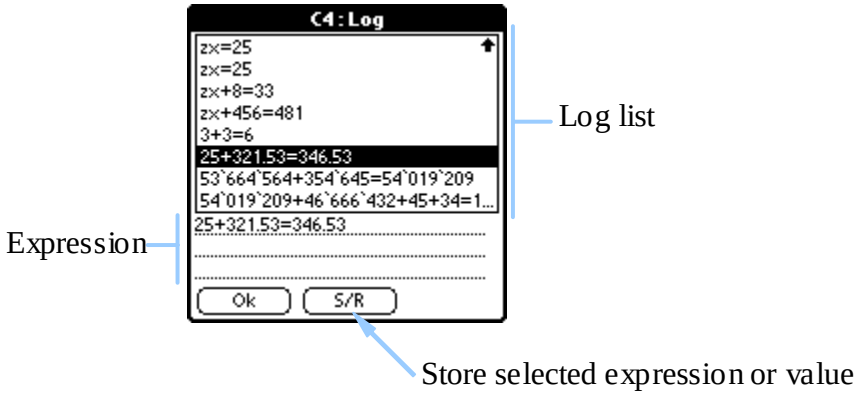



7. You can export the whole worksheet data to the MemoPad (build in application of the PalmOS™). In order to perform exporting, choose “Export to MemoPad” menu item from Options.




Then you need to enter a name for the new MemoPad record, press “Ok” and the record will be created.
This option is unavailable for some of the worksheets.

# Calculation log.

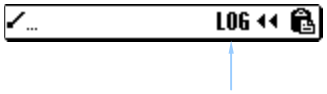



The Log screen is a powerful instrument to look up at the calculations you have done. It keeps up to 30 last solved lines (lines that contain the '=' symbol) and clears automatically. You can choose any of the previous calculations by using the log list. Select any part of an expression (or the whole expression) and copy the selected part to the clipboard or into desired registers and variables.

Double tapping on any item in the Log list copies it into the currently active edit field.

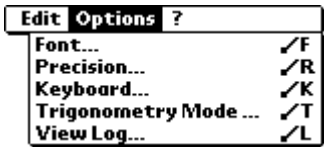
You can open the log list via floating menu bar or application menu.

**Floating menu bar**



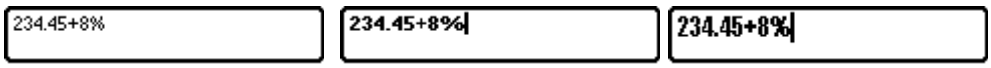

**Application menu**
(Options)

# Customizing the software.



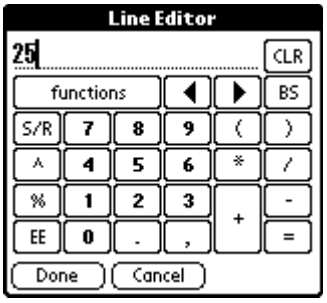

Customize C4Finace via Option menu.

***Font.***
Select edit field font of the main screen.




***Precision.***
Select notation and precision of the result.

***Keyboard.***
Select mode of C4 worksheets work. For use keyboard mode, the onscreen line editor (keyboard) will appear each time you tap field of the C4 worksheets.




Otherwise, you have to use Graffiti or standard onscreen keyboard to enter data.

***Trigonometry mode.***
Select a way how the trigonometry functions calculate. (Radians or degrees)

Radians: **cos(90)= -0.448073616**
Degrees: **cos(90)=0**

# Math.

No complex numbers and lists are supported.
Choose ‘Math’ from the category menu.

| | | | |
|---|---|---|---|
| round | 10^x | e^x | x² |
| N! | log | ln | log2 |
| cbrt | sqrt | \|x\| | NEXT |

| | | | |
|---|---|---|---|
| ipart | fpart | mod | PREV |
| drem | hypot | gamma | |
| | | | |

Functions you can use:

## +, -, *, /

Addition, subtraction, multiplication and division with real numbers.
Use ‘-‘ (minus) before a number to make it negative.

```
-2+3=1.00
```

## ^, sqrt, sqrt(x), cbrt, cbrt(x).

Power, square, square root and cube root with real numbers.

## recip(x)

Inverse or reciprocal function with real numbers.

```
recip(5)=0.20
```

## 10^x, log, log(x), ln, ln(x), log2, log2(x)

Power of 10, base 10 logarithm (log), natural logarithm (ln) and base 2 logarithm (log2) with real numbers.

## e^x, exp(x)

Exponential function of x, $e^x$ .

```
exp(2+3)=148.41
```

## |x|, abs(x)

Absolute value of x.

## N!, x!

Factorial of x. You can use factorial with positive real numbers.

## round, round(x)

Round x to nearest integer value away from zero.

## mod ,mod(x,y)

Modulo remainder of x/y. You can use real numbers for both x and y values.

## drem, drem(x,y)

Reminder of x/y. You can use real numbers for both x and y values.

## hypot, hypot(x,y)

Hypotenuse of right triangle. ( $\sqrt{x^2 + y^2}$ )

## gamma, gamma(x)

Returns gamma function value of x. ( $\Gamma(x)$ )

## ipart, ipart(x), fpart, fpart(x)

Integer ( ipart(x) ) or fractional ( fpart(x) ) part of real x.

**ipart(2.6)=2  fpart(2.6)=0.6**

# Financial calculations.

Choose ‘Finance’ in the category menu.

| | | | |
|---|---|---|---|
| TVM | CFLO | BOND | DEPR |
| ICNV | BRKEV | BLSCH | FOREX |
| sppv | spfv | uspv | usfv |

## *Time Value of Money.*

TVM

Time value of money (TVM) calculations are calculations based on money earning interest over a period of time. This worksheet lets you do TVM calculations with simple and compound interest.

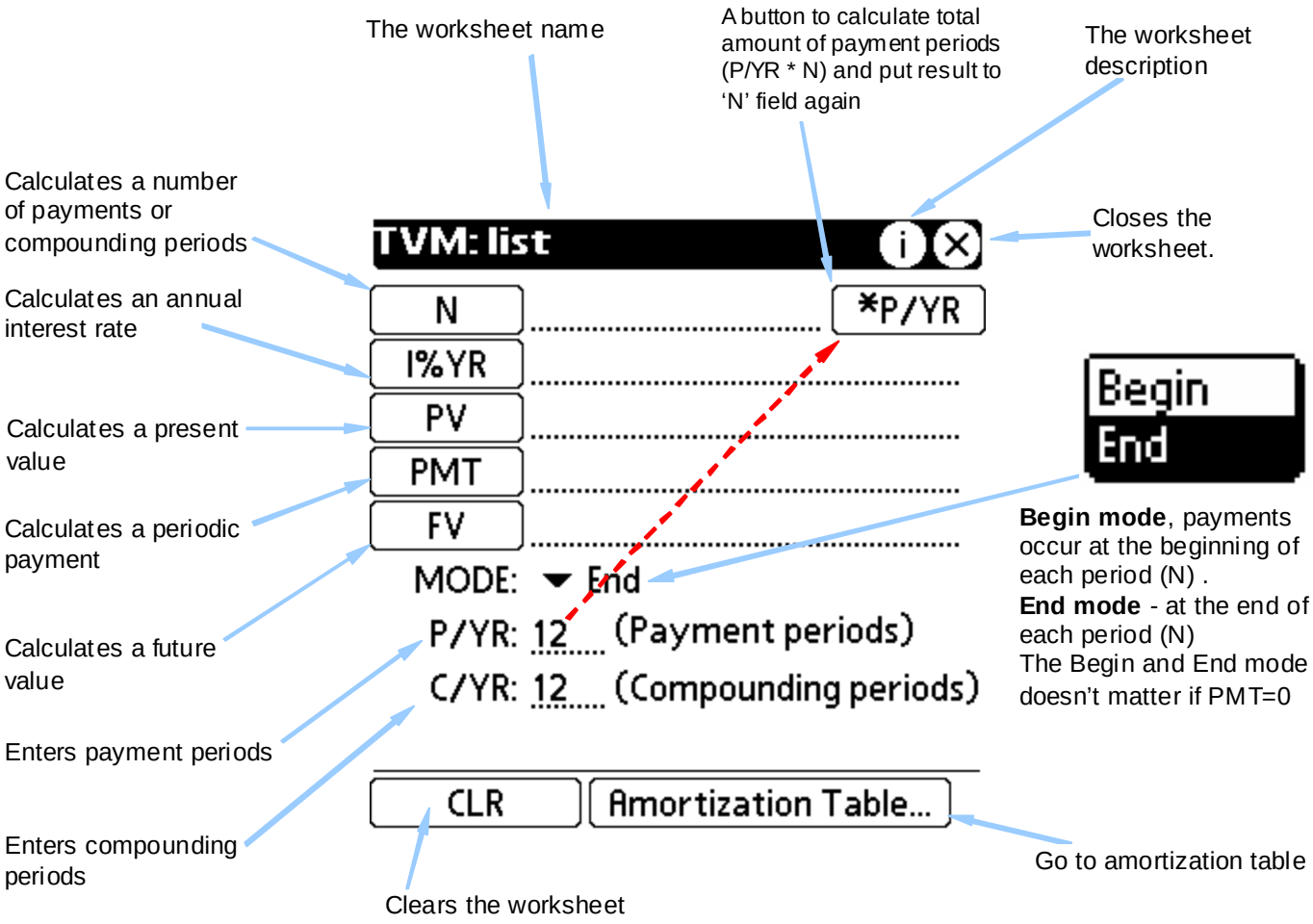
**Simple interest.** Interest earned only on the original principal amount invested.

**Compound interest.** Interest earned on both the initial principal and the interest reinvested from the prior periods.

**A TVM worksheet lets you calculate:**

- Future Value. The amount an investment is worth after one or more periods.
- Present Value. The current value of future cash flows discounted at an appropriate discount rate.
- The dollar amount of each periodic payment.
- The nominal annual interest rate as a percentage.
- Total number of payments or compounding periods.
- Amortization schedule.

### *Time Value of Money worksheet.*




N, I%YR, PV, PMT, FV are labels of the corresponding fields and buttons to compute the result.

### *Create new Time Value of Money list.*

In order to create a new data list you have to open application menu Option→New.
You will be asked for a name for the new worksheet name.

Enter a name, up to 11 symbols.

Your current worksheet will be saved automatically. If you do not need it, open worksheet list ( Option →Open… ) and delete it.

When you start the TVM worksheet for the first time after installation, you should define a name of the first worksheet before it starts.

### *Load existing worksheet.*

In order to load an existing worksheet, go to Option →Open…. Choose the name you need and tap the "Open" button. The list will be loaded.

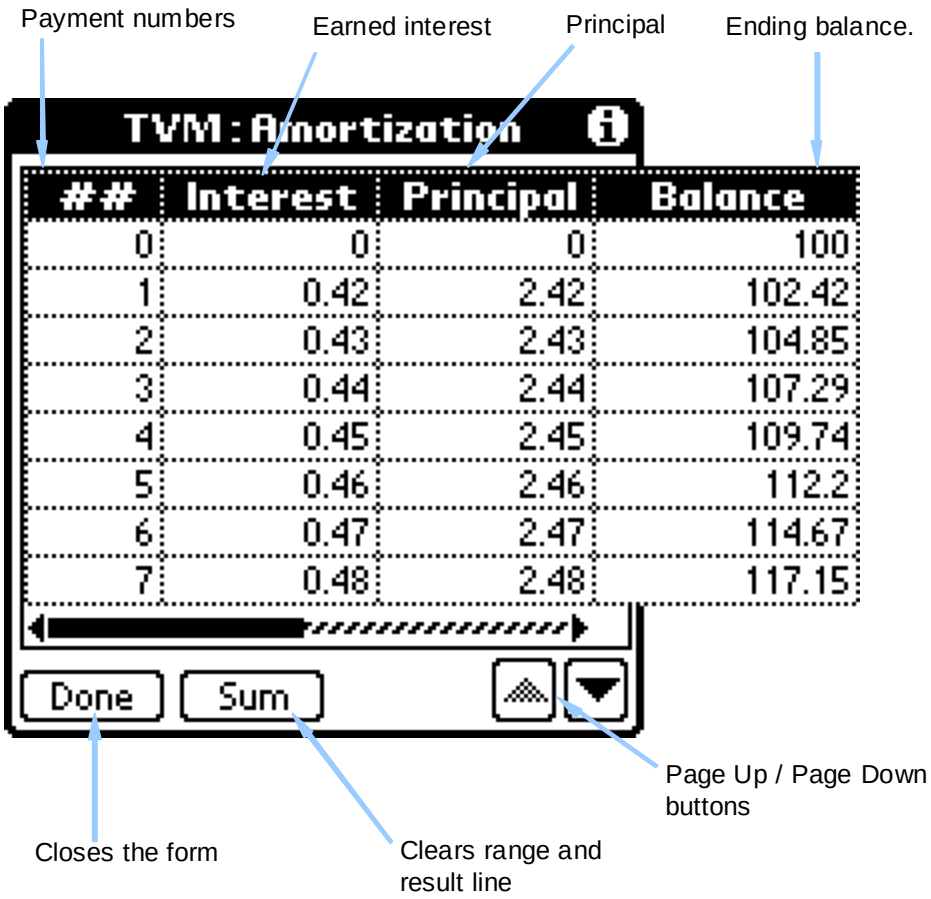
### *Calculations.*

1. Prior to any calculation check the options that define calculation parameters (MODE, P/YR, C/YR). Set them according to the needs of your problem.
2. Fill out all of the fields except unknown one.
3. Tap the button with the unknown variable and the result will appear in the corresponding field.

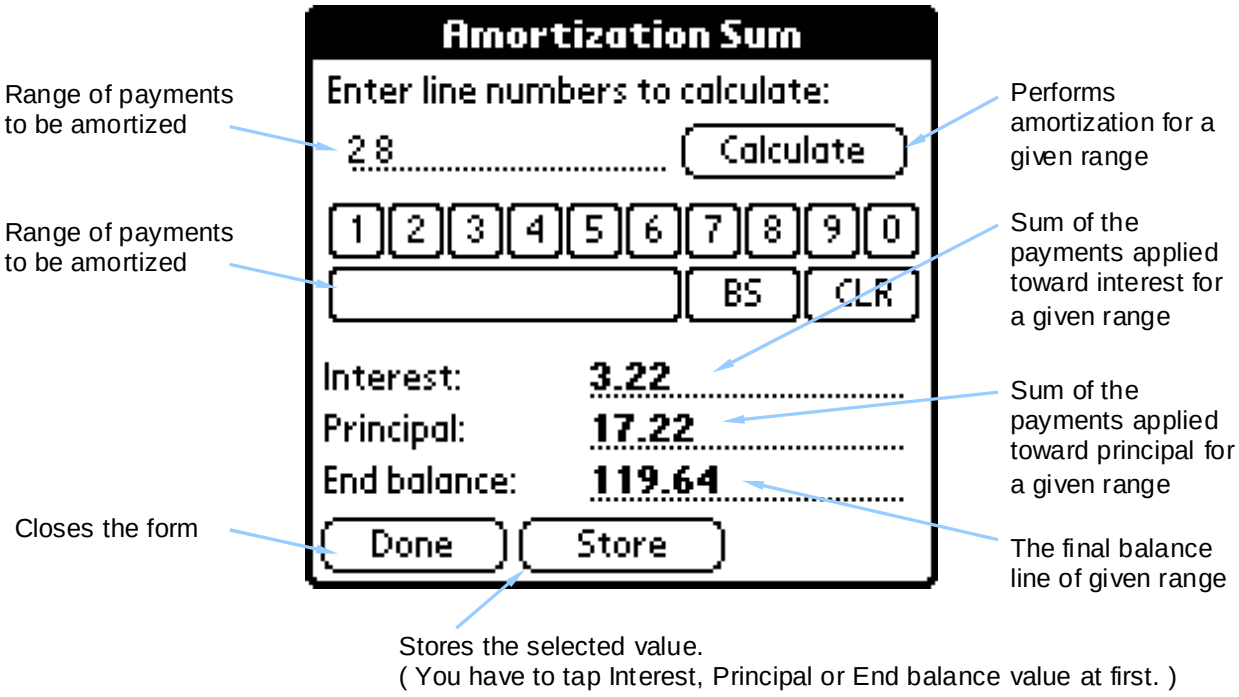
### *Amortization table.*

Amortization table shows and prints the following values:

- Payment numbers
- The amount of the payments applied toward interest
- The amount of the payments applied toward principal
- The balances after each payment has been made



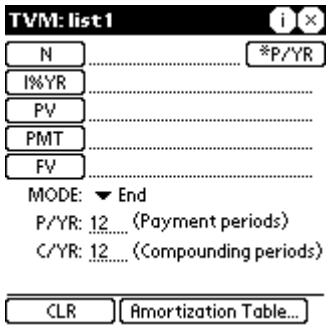
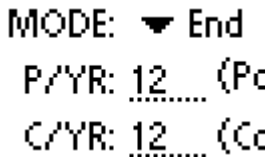
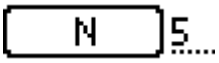
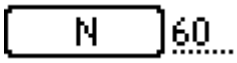
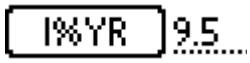
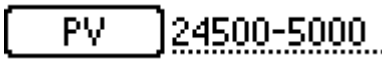
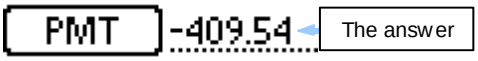

In order to get an amortization schedule for many payments tap “Sum” button and go to Amortization Sum form. Enter the range of payments to be amortized. A space symbol is the separator between these two numbers. (For example: “2 8”) After that tap the”Calculate” button.



***Examples.***

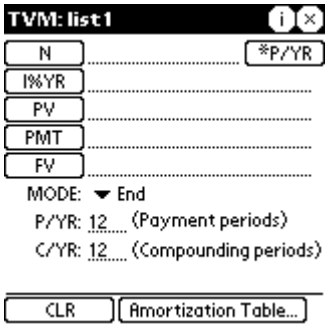
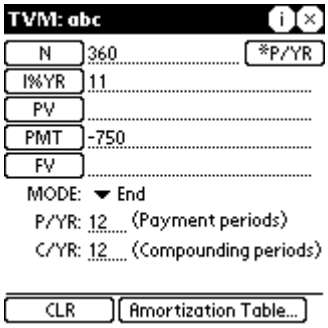
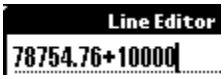
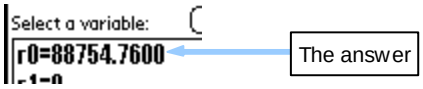
**A Car Loan.**

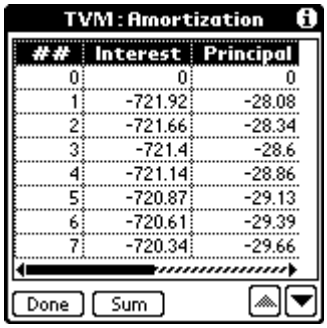
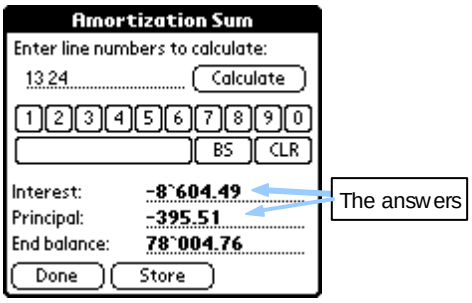
You are going to buy a new car and your auto dealer has offered you a 5-year loan at 9.5% annual interest, compounded monthly. The car price is $24,500 and your down payment is $5,000. Your payments start at the end of the first month after the purchase. What will be your monthly payments?

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” |  | Clears the worksheet and sets default values |
| ODE: End<br>P/YR: 12<br>C/YR: 12 |  | Loan payments at the end of each month, 12 payment per year |
| N: 5 |  | 5-year loan |
| Tap “*P/YR” button |  | Number of payments 5*12=60 |
| I%YR: 9.5 |  | 9.5% annual interest rate |
| PV: 24500-5000 |  | Loan amount |
| Tap “PMT” |  | Your monthly payment for this loan. |

**A Home Mortgage.**

You would like to buy a house and after consideration of your personal finances you have decided that you can afford $750 to spend each month on a 30-year mortgage. Also, you can afford a $10,000 down payment. Annual interest rate is 11%. What is the maximum house purchase price you can afford? Calculate the amount of the second year’s payments for loan that are applied toward interest and principal.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap ‘CLR’ |  | Clears the worksheet and set default values |
| Fill out the worksheet according to the problem. |  | |
| Tap “PV” | | Calculate loan amount. |
| +10000 |  | Loan plus down payment is the total price of the house. |
| Select the whole line and tap “S/R” and store result to r0 register | | |
| From the TVM worksheet tap “S/R” again. |  | You can afford $88,754.76 house purchase price. This is the first answer. |
| Tap “Cancel” and go back to TVM worksheet.<br>Leave the loan amount 78754.76 in the PV field (select and delete “+10000” part of expression) | | |

| | | |
|---|---|---|
| Tap “Amortization Table…” |  | Go to amortization table |
| Enter ‘13 24’ end tap ‘∑’. |  | Amount of the second year (from 13 to 24 months) payments: interest and principal. |

## *Cash Flow Calculations.*

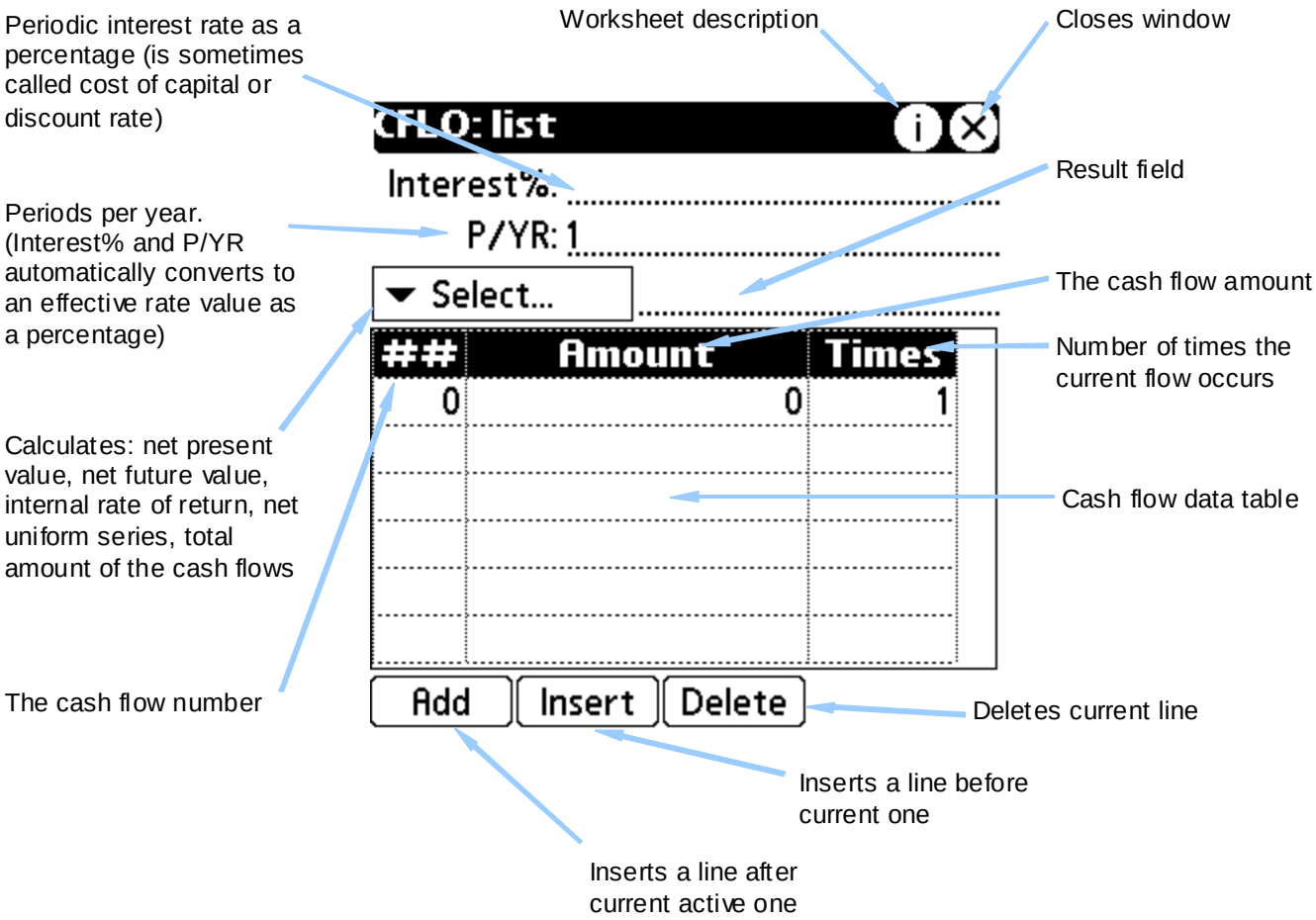
CFLO

The Cash Flow worksheet stores and analyzes the value of payments over equal periods of time. You can enter either equal or unequal cash flows, which can be cash inflows or outflows.

**A Cash Flow worksheet lets you calculate:**

- Net present value (NPV)
- Net Future Value (NFV)
- Internal Rate of Return (IRR)
- Net Uniform Series (NUS)
- The total amount of the cash flows (Total)

### *Cash Flow worksheet.*




### *Creating a Cash Flow list.*

In order to create a new data list you have to open application menu Option→New.
You will be asked for a name for the new worksheet name.

Enter a name, up to 11 symbols.

Your current worksheet will be saved automatically. If you do not need it, open worksheet list ( Option →Open… ) and delete it.

When you start the Cash Flow worksheet for the first time after installation, you should define a name of the first data list before it starts.

### *Load existing worksheet.*

In order to load an existing worksheet, go to Option →Open…. Choose the name you need and tap the "Open" button. The list will be loaded.

### *Calculations.*

1. Fill in the cash flow data table.
2. Enter a periodic interest rate ( **Interest%** )
3. Select a corresponding calculation you want

and the result will appear in the result field.

### *Entering Cash Flows.*

In order to enter a cash flow you just need to fill in the table. Initially (when you just created a list) the table has one line only (flow 0). The 'Flow 0' is an initial flow (often it is negative). You cannot edit the 'Times' value for the 'Flow 0'; this value must always be "1". Tap "Add" or "Insert" button in order to add a new line in the table. Pay attention to the sign (positive or negative) of cash flow amount figures. Positive figures in the worksheet are considered as inflows, negative figures are outflows. 'Times' is the number of consecutive occurrences of the current flow.

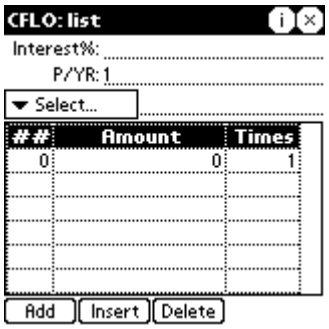
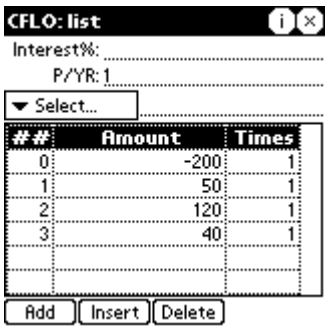
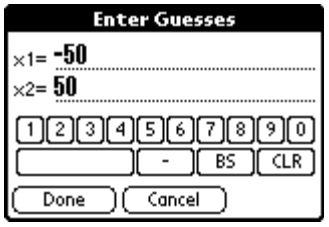
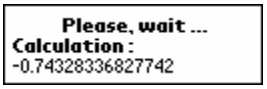
After entering data into the cash flow table, enter a periodic interest rate; it can be a number or an expression.

### *Examples.*

**IRR.**

Find the internal rate of return for a given cash flow:

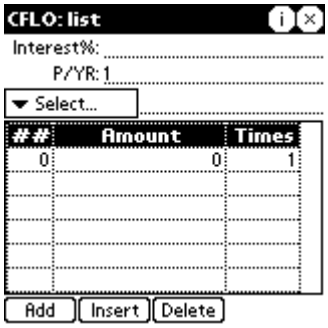
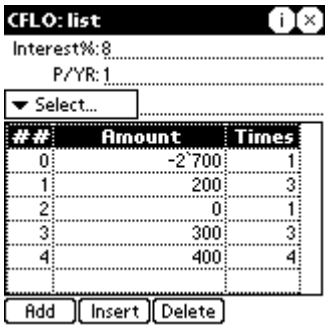
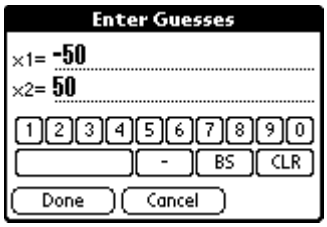
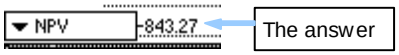
| **0** | **1** | **2** | **3** |
|---|---|---|---|
| -200 | 50 | 120 | 40 |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Options→ New if you need to create a new empty list. |  | Let's start with a worksheet. |
| Fill out the table according to the problem. |  | |
| Select "IRR" from the pop-up menu |  | Enter your guess for IRR as a percentage. In this case you guess that IRR value can be between –50% and 50%. 'x1' is the smallest value of your guess, 'x2' is the largest value. |
| Tap "Done" button to start the calculation. |  | Performing the calculation. |
| | | View the result. Appearance of the calculated answer depends on number of digits selected in Preferences. |

**An Investment with Grouped Cash Flows.**

You are considering an investment that requires a cash outlay of $2700, with the promise of monthly cash flows as shown. Annual interest rate is 8%. Find IRR, NPV and NFV.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| -2700 | 200 | 200 | 200 | 0 | 300 | 300 | 300 | 400 | 400 | 400 | 400 |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Options→ New if you need to create a new empty list. You can clear the current list by tapping the "Delete" key 2 times. |  | Let's start with a new list. |
| Enter the given cash flows. |  | |
| Select "IRR" from the pop-up menu |  | Enter your guesses for IRR as a percentage. In this case you guess that the IRR value can be between –50% and 50%. 'x1' is the smallest value of your guess, 'x2' is the largest value. |
| Tap 'Done' to start the calculation and see the result | | IRR value in the result field |
| Select "NPV" from the pop-up menu |  | NPV value in the result field |
| Select "NFV" from the pop-up menu | | NFV value in the result field |

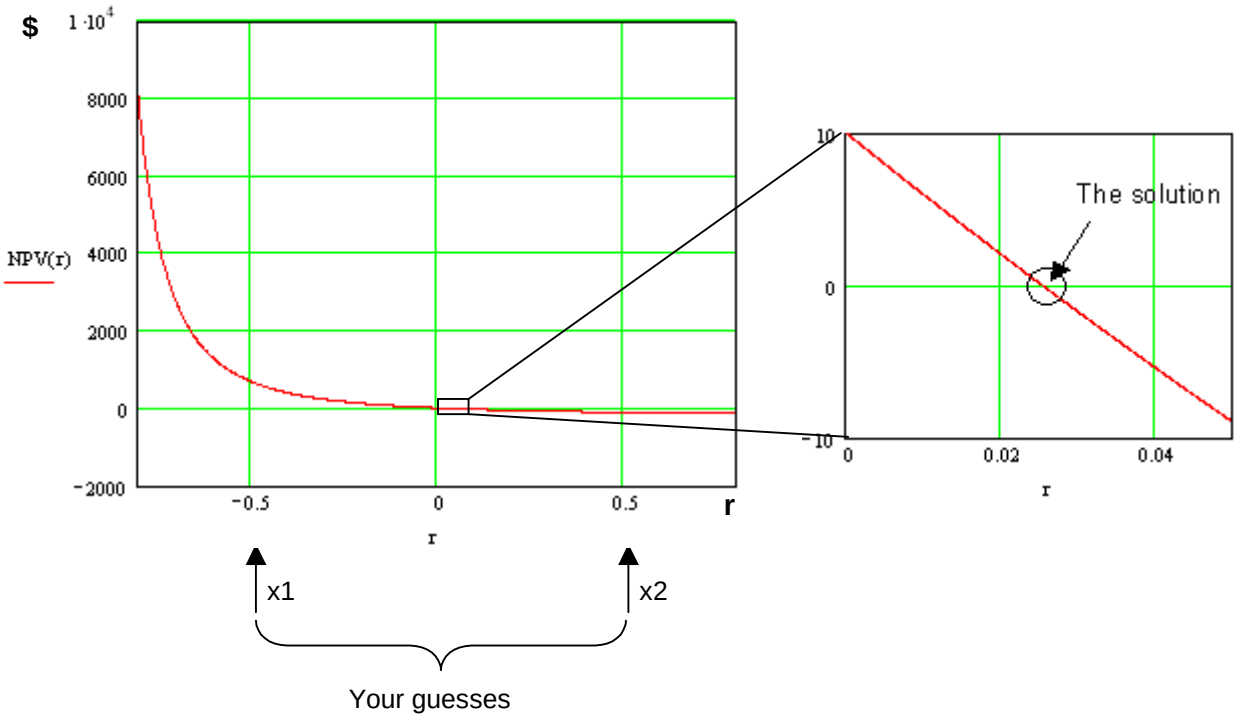
***Theory.***

The calculator, in the case of IRR, solves an equation by using trial and error method.

$$NPV(r) = CF_0 + \sum_{i=1}^{N} \frac{CF_i}{(1+r)^i}; \text{ where } NPV(r) = 0$$

The solution of the equation is at a point where the net present value profile intersects the 'r' axis. Look at the pictures below; this is the NPV profile for the previous example.

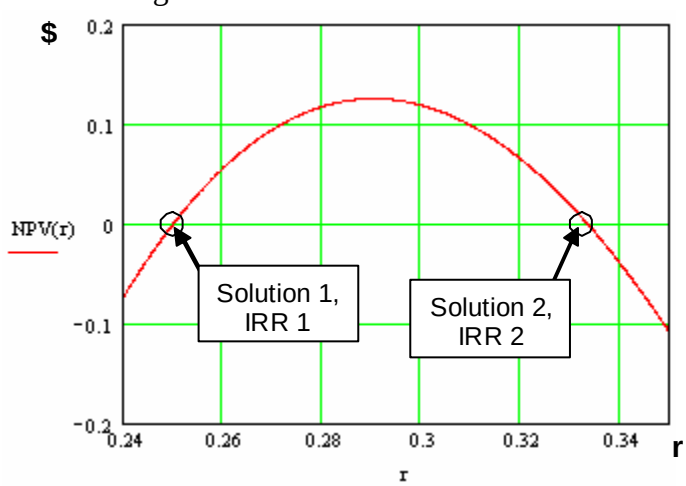
$$NPV(r) := CF_0 + \sum_{i=1}^{N} \frac{CF_i}{(1+r)^i}$$




***Why do I need to enter guesses?***

C4Finance lets you solve multiple rate of return problems. You can find a solution for any given range.

For example the following cash flow has two IRRs.




| ## | Amount | Times |
|---|---|---|
| 0 | -120 | 1 |
| 1 | 310 | 1 |
| 2 | -200 | 1 |

You can find them by entering guesses: x1=0, x2=30 for the first solution, x1=30, x2=100 for the second solution.

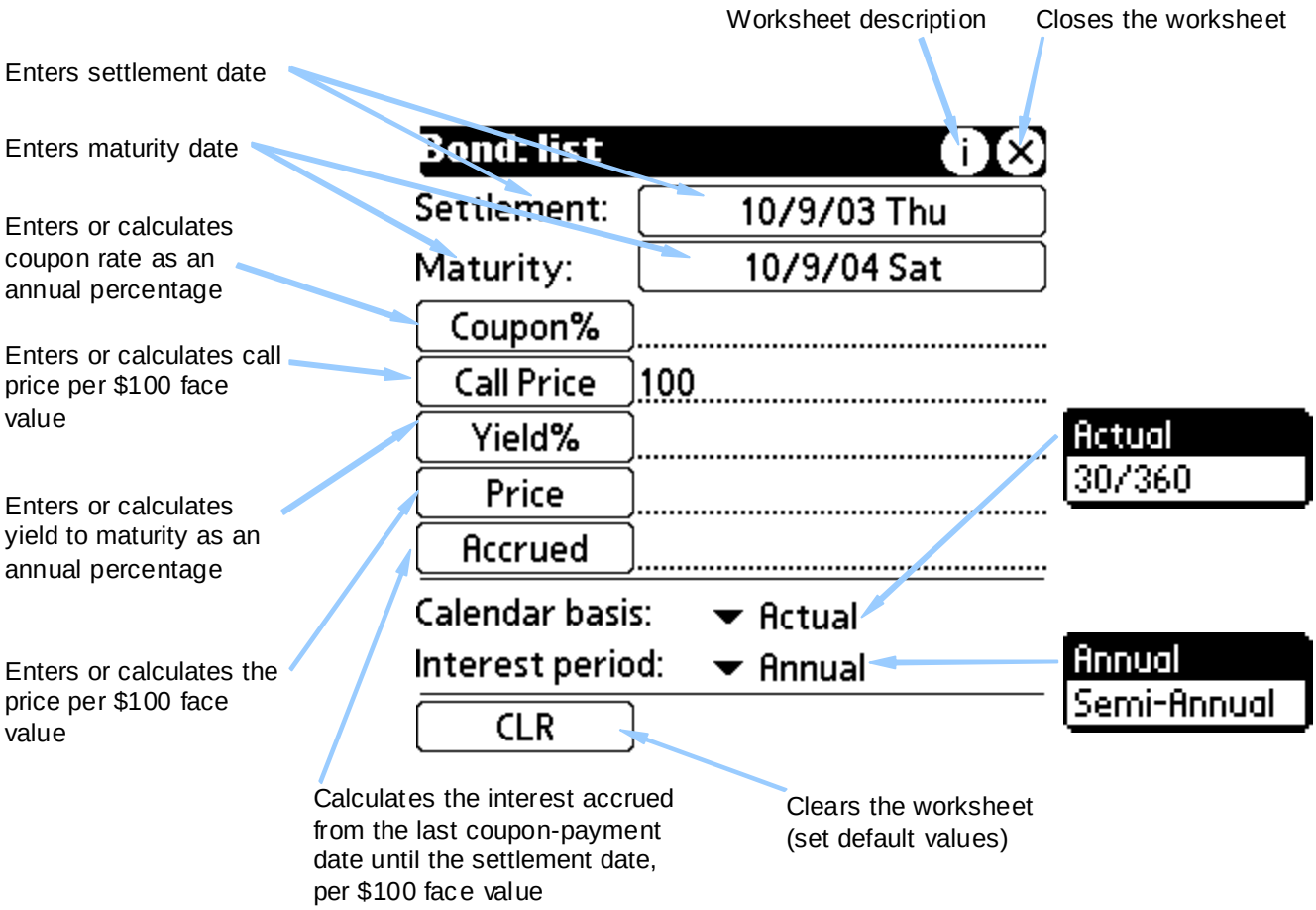
## *Bond.*

BOND

**A Bond worksheet lets you calculate:**

- Yield to maturity or yield to call date as an annual percentage (Yield%)
- Price of the bond per $100 face value (Price)
- Interest accrued from the last coupon-payment date (Accrued)
- Call price per $100 face value (Call price)
- Annual coupon rate as a percentage (Coupon%)

### *Bond worksheet.*



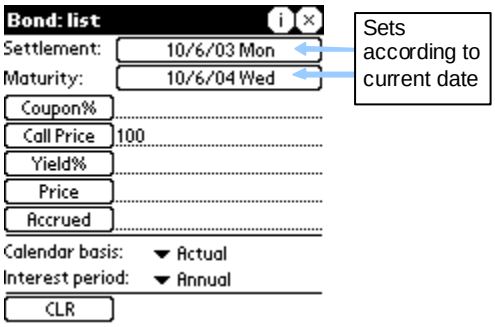
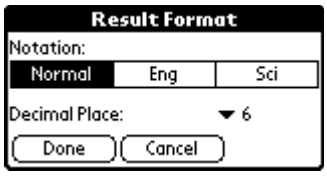

### *Calculations.*

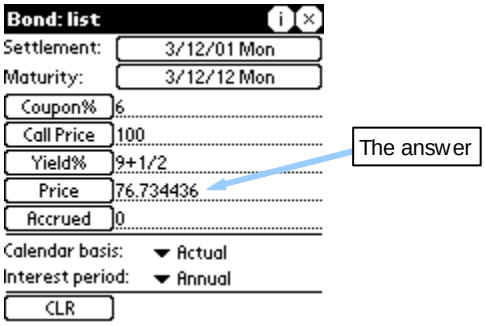
1. Prior to any calculation check the options that define calculation parameters (Calendar basis and interest period). Set them according to the needs of your problem.
2. Fill out all of the fields except unknown ones.
3. Tap the button with the unknown variable and the result will appear in the corresponding field.

"Call Price", "Price" and "Accrued" are expressed per $100 face value or as a percentage.

***Examples.***

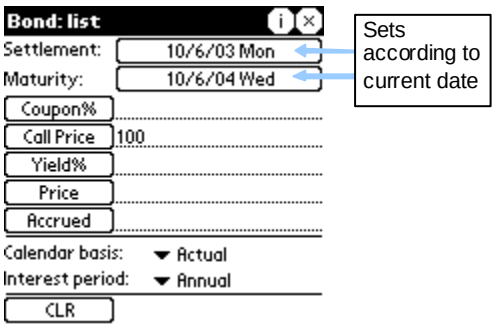
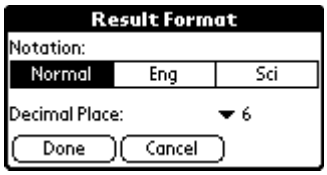
**Bond Price.** TXP Inc. has 6% coupon bonds on the market that mature on March 12, 2012. The bonds make annual payments. If yield to maturity on these bonds is 9½%, what is the current bond price on March 12, 2001.

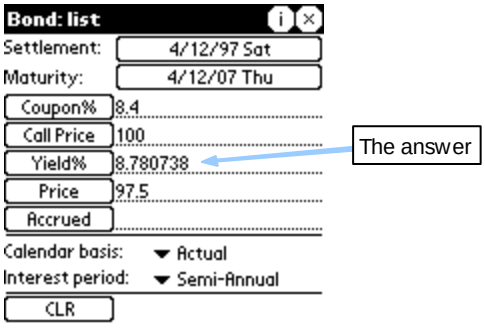
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap "CLR" button to clear the current worksheet |  | Let's start with clear worksheet. |
| Go to the application menu (Options → Precision…) and set Decimal Place to 6, Notation – Normal, then tap "Done" |  | |
| Set Settlement to March 12, 2001 | | Sets settlement date |
| Set Maturity to March 12, 2012 | | Sets maturity date. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Fill out the worksheet according to the problem. Do not forget about “Calendar basis” and “Interest period” | | |
| Tap “Price” button. |  | The answer is 76.734436 or $767.34 |

**Bond Yield.**

Furst Co. issued 12-year bonds on April 12, 1995 at a coupon rate of 8.4 percent. Suppose today is April 12, 1997. The bonds make semiannual payments. If these bonds currently sell for 97.5 percent of the par value, what is the YTM?

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” to clear the current worksheet |  | Let’s start with a clear worksheet. |
| Go to the application menu (Options → Precision…) and set Decimal Place to 6, Notation – Normal, then tap “Done” |  | |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Set Settlement to April 12, 1997 | | Sets settlement date |
| Set Maturity to April 12, 2007 | | Sets maturity date. |
| Fill out the worksheet according to the problem. Do not forget about “Calendar basis” and “Interest period” | | |
| Tap “Yield” button. |  | The answer is 8.780738 or 8.78% |

## *Depreciation.*

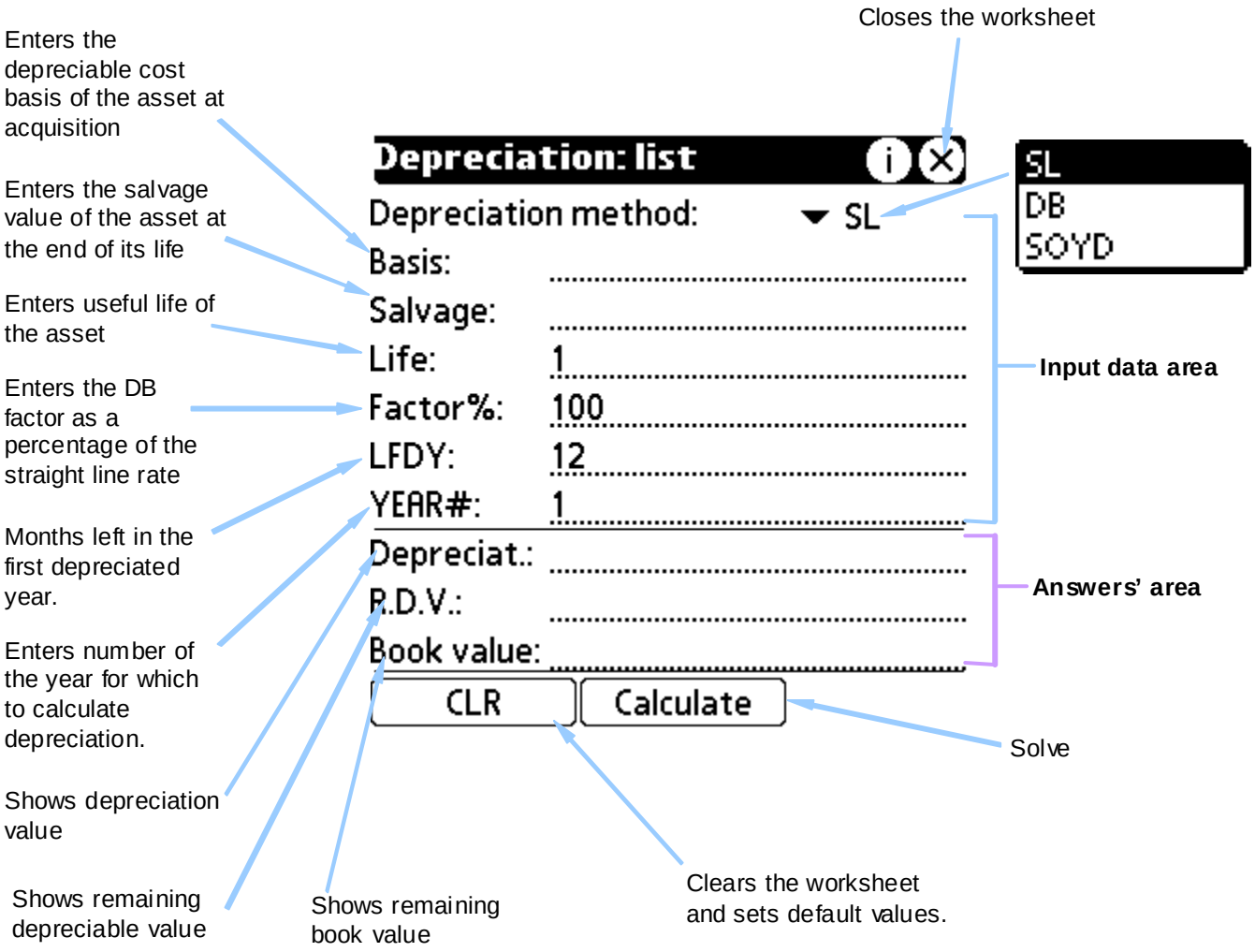
DEPR

The Depreciation worksheet calculates depreciation values, remaining depreciable values and remaining book values one year at time. The following methods are available:

- **Straight line**
- **Declining balance**
- **Sum-of-the-years' digits**

**Accelerated Cost Recovery System** is available without this worksheet (see example below).

### *Depreciation worksheet.*




LFDY is **L**ength of the **F**irst **D**epreciation **Y**ear (in months) or months left in the first depreciated year. For example if some assets are in service from August 1, the LFDY will be 5; 12 (month in a year) – 7 (the beginning of August).

5 months

| Months: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | February | March | April | May | June | July | August | September | October | November | December |

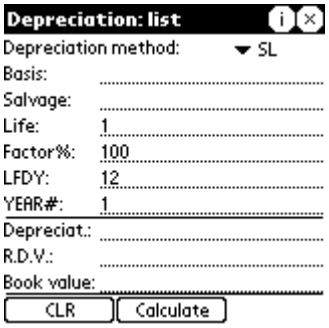
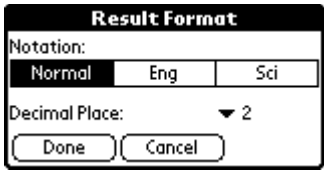
### *Calculations*

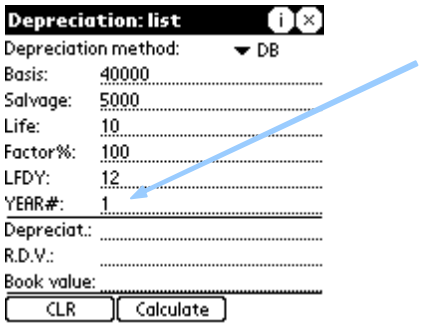
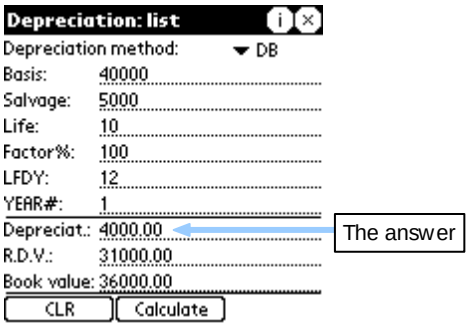
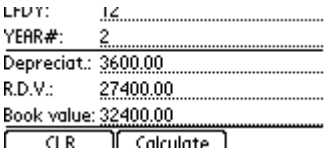
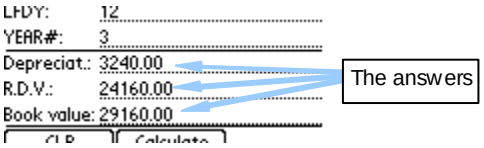
1. Choose a depreciation method from the pop-up menu.
2. Fill out all of the fields in the input data area. (Answer's area is not editable)
3. Tap "Calculate" button, to get the answer: depreciation, remaining depreciable and remaining book value.

### *Examples*

**Declining-Balance Depreciation.**

A truck, purchased for $40,000, is to be depreciated over 10 years. At the end of its service life the salvage value is estimated at $5,000. Find the depreciation, remaining depreciable value and book value of the third year and sum of the depreciation values up to this year.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap "CLR" to clear the current worksheet |  | Let's start with a clear worksheet. |
| Go to the application menu (Options → Precision…) and set Decimal Place to 2 and notation to normal, then tap "Done" button. |  | |

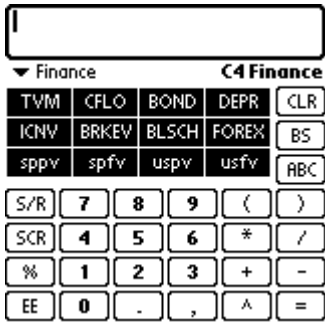
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Fill out the worksheet according to the problem. |  | Notice, this form is ready to start calculation for the first year only. |
| Tap "Calculate" to perform the calculation. |  | Get depreciation value for the first year. |
| Put "4000.00" value to r0 register. (From Line editor tap "S/R" or select Options→Store/Recall) | | |
| Enter at "YEARS#" field "2" and tap "Calculate" |  | Get depreciation value for the second year (3,600). |
| Add "3600.00" value to r0 register. (From Line editor tap "S/R" or select Options→Store/Recall) | | Add the second year depreciation value to the clipboard. |
| Enter at "YEARS#" field "3" and tap "Calculate" |  | Get depreciation value, remaining depreciable value and book value of the third year. |
| Add "3600.00" value to r0 register. (From Line editor tap "S/R" or select Options→Store/Recall) | | Add the third year depreciation value to the clipboard. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Open Store/Recall window again to see r0 register value | | Sum of the depreciation values for the three years. |

**ACRS deduction.**
By using the ACRS method, find the income tax deduction for a $10,000 asset over 3 years of a 6-year life. Take into account the following hypothetical ACRS table:

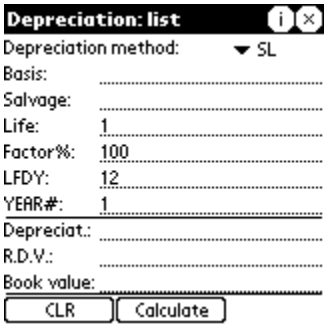
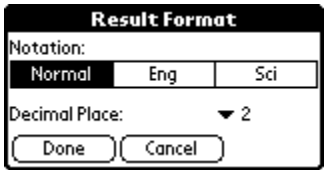
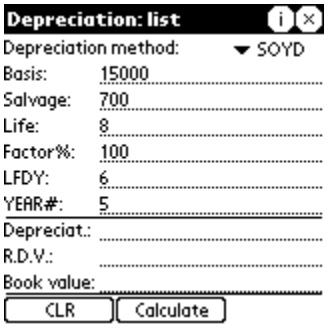
| Year | Percentage Deductible |
|---|---|
| 1 | 10 |
| 2 | 20 |
| 3 | 15 |
| 4 | 15 |
| 5 | 20 |
| 6 | 20 |

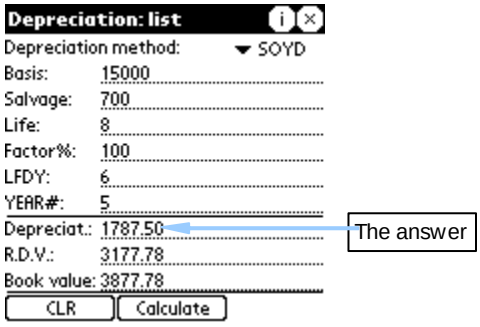
You will not find support for the ACRS method in the C4Finance Depreciation worksheet. In order to work with ACRS problems go to the main screen.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Go to the main screen, tap “CLR” if you need to clear the edit field. |  | |
| 10000*10% | **10’000*10%** | Enter basis and percentage deductible of year 1. |
| Tap “=” | **10’000*10%<br>=1’000** | Deduction in the first year. |
| Tap “CLR” then 10000*20%= | **10’000*20%<br>=2’000** | Deduction in the second year. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” then 10000*15%= | **10’000*15%<br>=1’500** | Deduction in the third year. |

**Partial-Year Depreciation.**
An industrial network server bought for $15,000 has a useful life of 8 years with a salvage value of $700. Using the SOYD method, find the amount of the depreciation for the fifth year. The first depreciation year was 6 month long.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap CLR to clear current worksheet |  | Let’s start with clear worksheet. |
| Go to the application menu (Options → Precision…) and set Decimal Place to 2 and notation to normal, then tap “Done” button. |  | |
| Fill out the worksheet according to the problem. |  | |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “Calculate” to perform the calculation. |  | Depreciation value for the fifth year is $1787.50. |

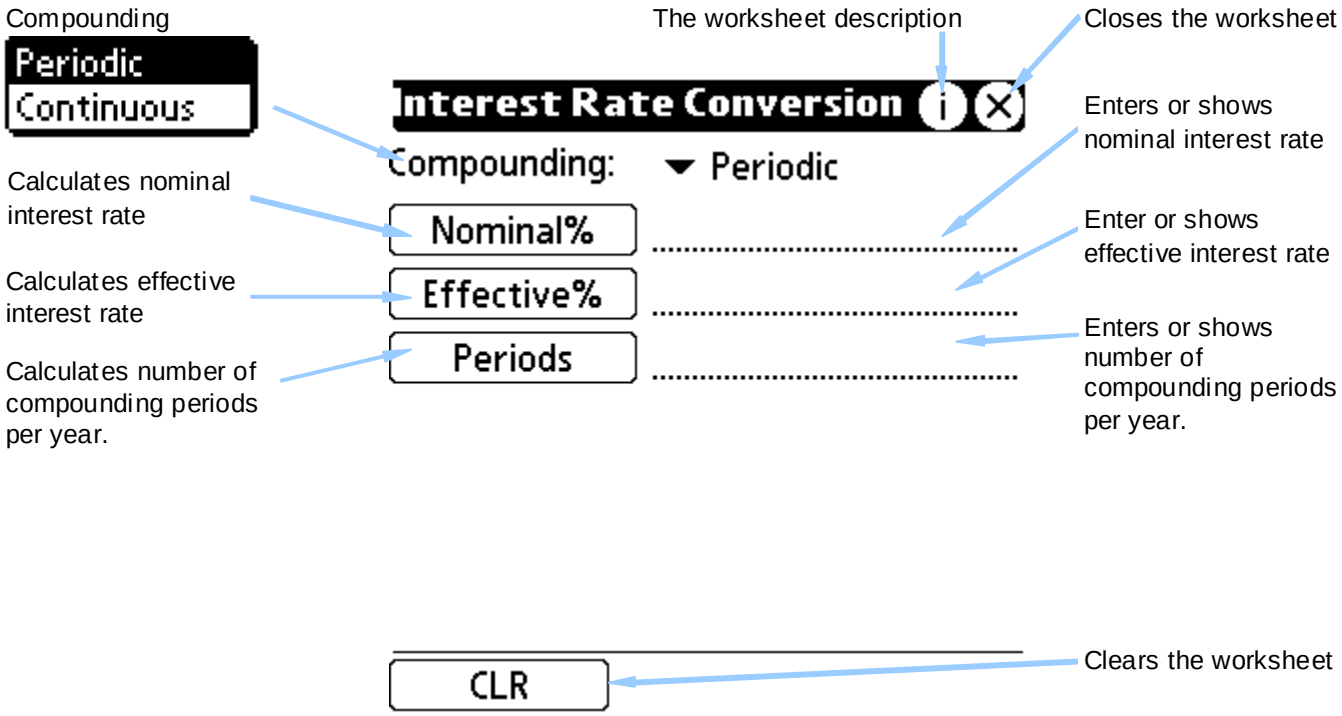
## *Interest rate conversion.*

ICNV

The interest rate conversion worksheet converts between nominal and effective interest rates. The conversion is performed by using one of the following:

- Periodic compounding
- Continuous compounding

### *Interest rate conversion worksheet.*




The look of the worksheet can change. It depends on what compounding you have chosen.

### *Calculations.*

1. Choose compounding.
2. Enter all variables except one.
3. Tap the button with the unknown variable.
4.

### *Example.*

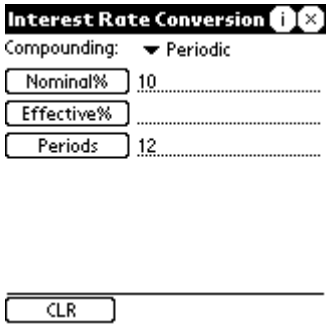
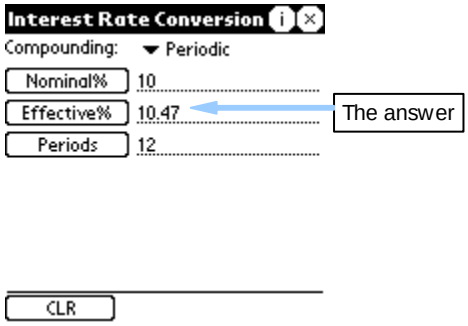
**Converting from a nominal to an effective interest rate.**

You are considering two investments.

The first promises you 10.3% effective interest rate.

The second promises you 10% annual interest, compounded monthly.

Which investment is the most attractive?

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Fill out the worksheet according to the problem. |  | You have to compare 10.3% effective interest rate with 10% nominal interest compounded monthly. So let's convert the nominal rate to the effective rate. |
| Tap "Effective%" |  | The answer is 10.47%. Therefore the second investment is more attractive than the first one. |

## *Breakeven.*

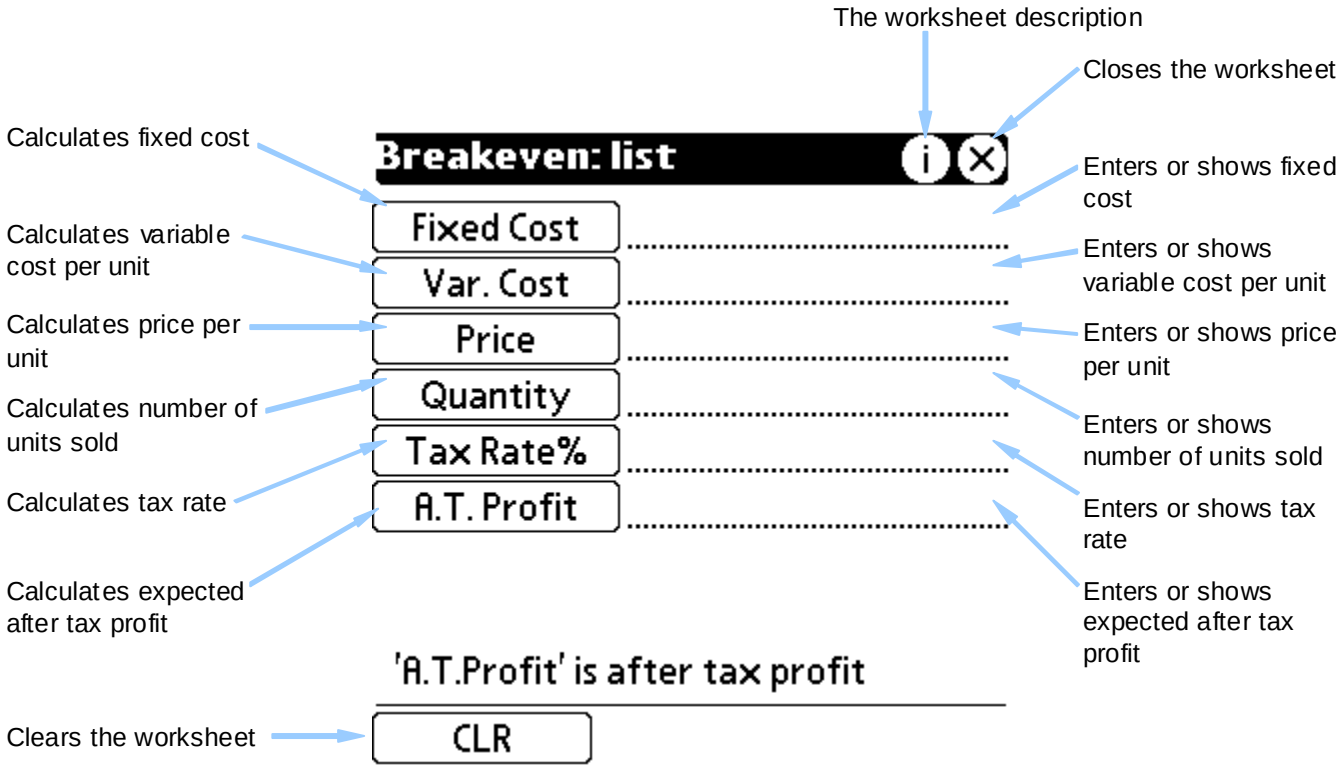
BRKEV

Breakeven is the sales level that results in zero project net income (NPV or operating cash flow).

**The breakeven worksheet let you calculate:**

- Expected profit
- Required quantity
- A unit price
- Variable cost
- Fixed cost

### *Breakeven worksheet.*



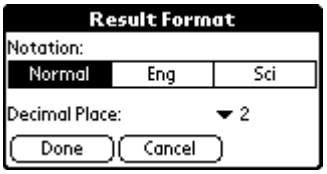
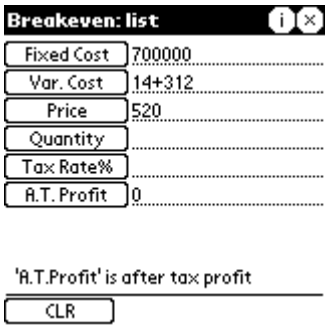
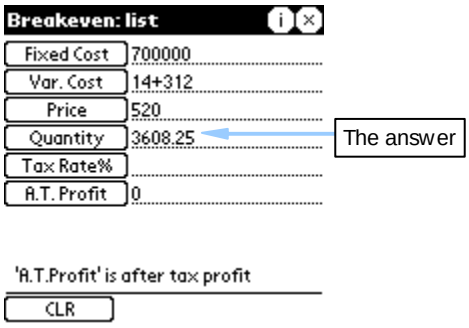

### *Calculations.*

1. Enter all variables except one.
2. Tap the button with the unknown variable to get the answer.

### *Example.*

**Required Quantity.**

Factory management is considering purchasing a new robotic line to start production. The implementation cost is $700,000. Maintenance cost for this line is $14 for each unit it produces. Cost of raw materials for each unit is $312 for this line. Wholesale price of each unit is $520. How many units should the factory sell to cover its cost for the new robotic line?

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” to clear current list | | |
| Go to the application menu (Options → Precision…) and set Decimal Place to 2 and notation to normal, then tap “Done” button. |  | |
| Fill out the worksheet according to the problem. Notice that A.T. Profit is set to 0 to achieve the result. |  | |
| Tap “Quantity” |  | The answer is 3,608.25 or 3609 units the factory should sell to cover its cost. |

## *Black-Scholes.*

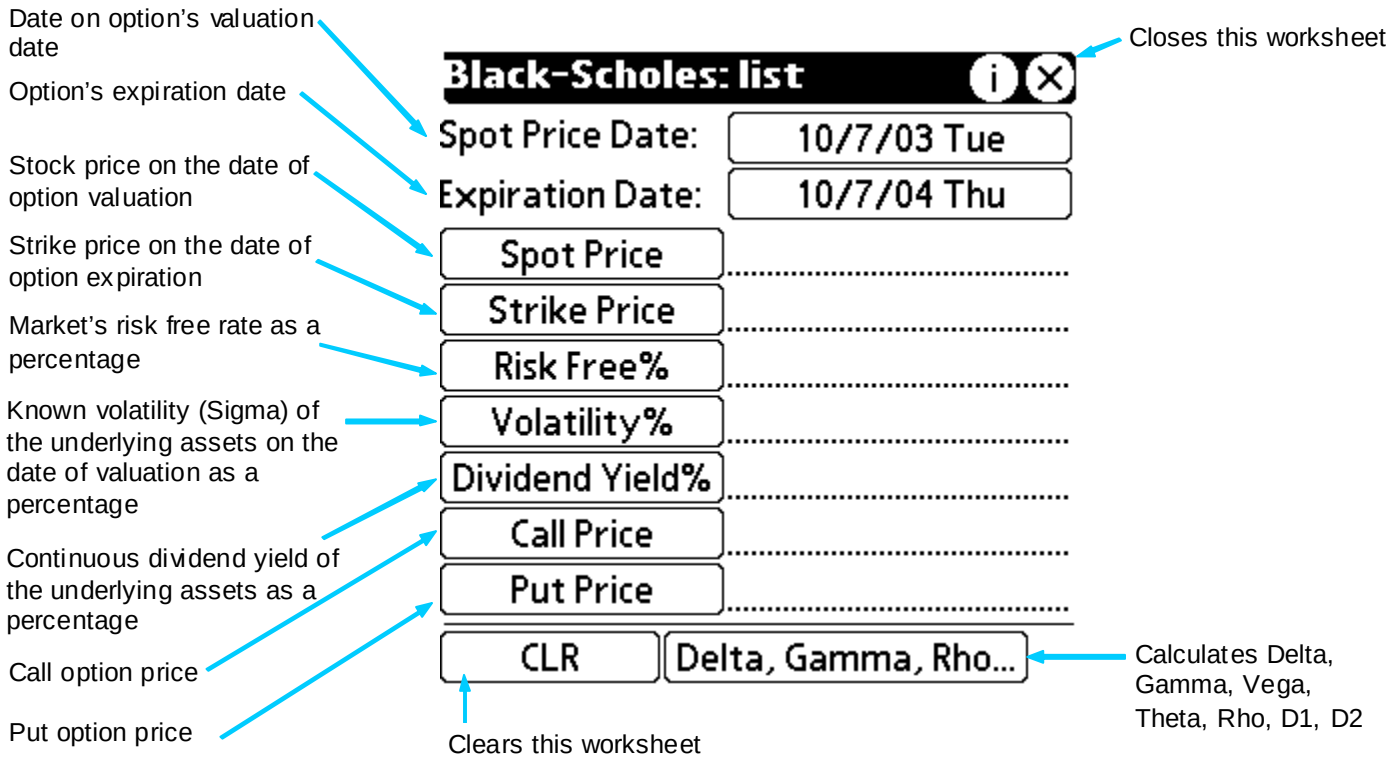
BLSCH

This worksheet uses popular Black-Scholes pricing model for evaluation European options on stocks paying a known continuous dividend (or non-dividend paying stocks) and other derivatives.

The Black-Scholes worksheet let you calculate:

- Call Price (on the day of valuation);
- Put Price (on the day of valuation);
- Spot Price (or Stock Price on the day of valuation);
- Strike Price (on the day of expiration);
- Risk Free rate (of the market);
- Volatility of the derivative
- Dividend Yield of the underlying assets;
- Delta;
- Gamma;
- Vega;
- Theta;
- Rho;
- D1 – Black-Scholes formula coefficient;
- D2. – Black-Scholes formula coefficient.

### *Black-Scholes worksheet.*



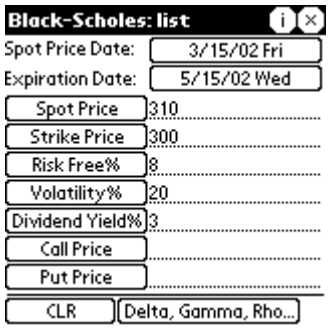
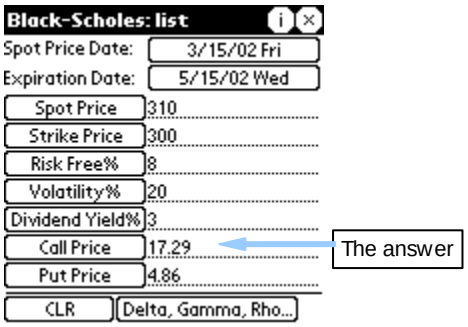

### *Calculations.*

1. Enter all variables except one.

2. Tap the button with the unknown variable to get the answer.

***Example.***

Suppose, today is March 15, 2002. Consider a European call option on the S&P 500 which is two months from maturity. The current value of the index is 310, the risk free interest rate is 8% per annum, and the volatility of the index is 20%. Dividend yields is 3% per annum.

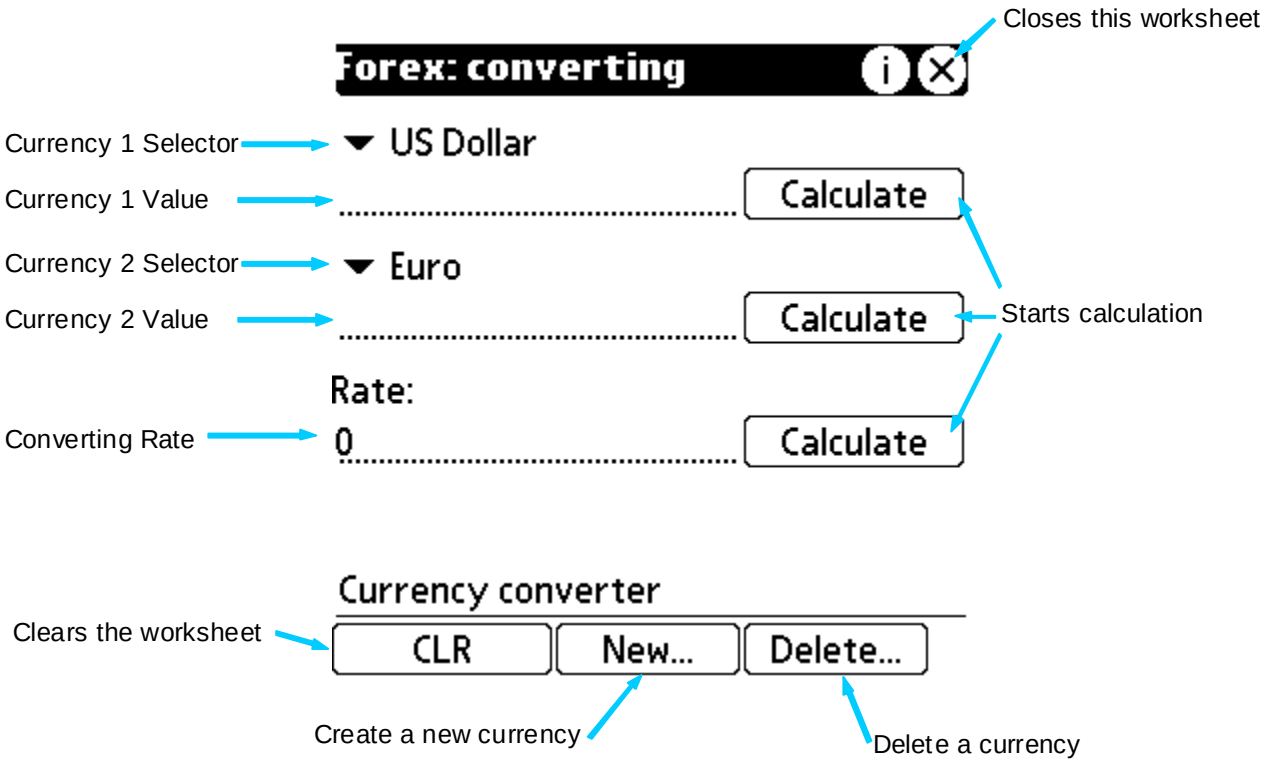
| **Keys/Actions:** | **Display:** | **Description:** |
|---|---|---|
| Tap "CLR" to clear worksheet.<br>Fill out the worksheet according to the problem. |  | Enter the problem's data. |
| Tap "Call Price" |  | The result is 17.28 or one contract would cost $1,728.00 |

## *Currency converter.*

FOREX

This worksheet lets you perform currency converting by predefined rate, create your own currency list, up to 30 items.

### *Currency converter worksheet.*

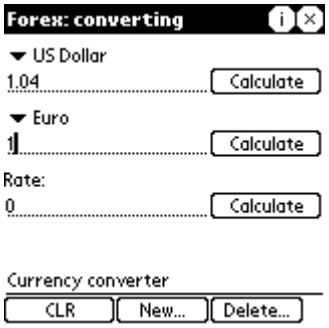
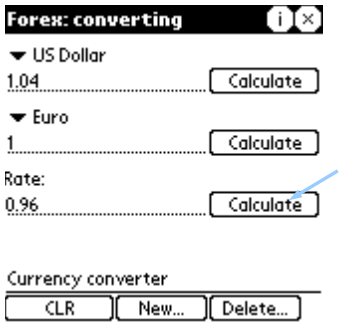
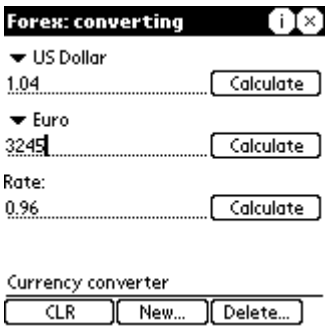
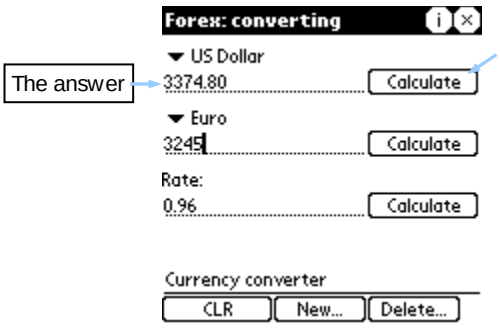



### *Calculations.*

1. Select required currency/currencies. Tap “New…” if need create new currency.
2. Enter two known values.
3. Tap “Calculate” for the unknown value.

### *Example.*

How much US dollars you need to buy € 3245, if €1 = $1.04

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” to clear worksheet. | | |
| Enter data to calculate the rate between US dollars and Euro. |  | |
| Tap “Calculate” to get the rate |  | Calculate the rate. |
| Enter the known Euro amount, € 3245 |  | |
| Tap “Calculate” to get the required US dollar amount |  | |

## *Actuarial Functions*

### *Single Payment Present Value.*

sppv

Present value of $1 due at the end of *n* periods.

$$\text{sppv}(i\%,\ n)=\left(1+\frac{i\%}{100}\right)^{-n}$$

*i%* - periodic interest rate, as a percentage;
*n* – number of compounding periods.

It also calls $\text{PVIF}_{i,n}$

*Example:* sppv(2,10)=0.82035

### *Single Payment Future Value.*

spfv

Future value of $1 at the end of *n* periods.

$$\text{spfv}(i\%,n)=\left(1+\frac{i\%}{100}\right)^{n}$$

*i%* - periodic interest rate, as a percentage;
*n* – number of compounding periods.

It also calls $\text{FVIF}_{i,n}$

*Example:* spfv(2,10)=1.21899

### *Uniform Series Present Value.*

uspv

Present value of an annuity of $1 per period for *n* periods.

$$\text{uspv}(i\%\ ,\ n)=\sum_{i=1}^{n}\frac{1}{\left(1+\frac{i\%}{100}\right)^{n}}=\frac{1-\left(1+\frac{i\%}{100}\right)^{-n}}{\frac{i\%}{100}}$$

*i%* - periodic interest rate, as a percentage;
*n* – number of compounding periods.

It also calls $\text{PVIFA}_{i,n}$

*Example:* uspv(2,10)=8.98259

***Uniform Series Future Value.***

usfv

Future value of an annuity of $1 per period for *n* periods.

$$\text{usfv}(i\%,\ n) = \sum_{i=1}^{n}\left(1+\frac{i\%}{100}\right)^{n-1} = \frac{\left(1+\frac{i\%}{100}\right)^{n}-1}{\frac{i\%}{100}}$$

*i%* - periodic interest rate, as a percentage;
*n* – number of compounding periods.

It also calls $\text{FVIFA}_{i,n}$

*Example:* usfv(2,10)=10.94972

## Business calculations.

Choose ‘Business’ in category menu.

| | | | |
|---|---|---|---|
| chg%o | chg%n | chg%p | |
| tot%pr | tot%p | tot%t | |
| mc%m | mc%p | mc%c | NEXT |

| | | | |
|---|---|---|---|
| mp%m | mp%p | mp%c | PREV |
| | | | |
| | | | |

### chg%p, chg%p(old, new)

The difference between *old* and *new* expressed as a percentage of *old*.

$$\%chg = \frac{new - old}{old} \times 100$$

*Example:* chg%p(200,220)=10

### chg%o, chg%o(new, %chg)

Get initial value of the number *(old)*, according to its changed value *(new)* and a percent of change of the initial value *(old)*.

$$old = \frac{new}{100 + \%chg} \times 100$$

*Example:* chg%o(220,10)=200

### chg%n, chg%n(old, %chg)

Get value of the number *(new)*, according to its initial value *(old)* and its percent of change.

$$new = \frac{(100 + \%chg) \times old}{100}$$

*Example:* chg%n(200,10)=220

### tot%pr, totl%pr(total, part)

The portion that one number *part* is of another *total*, expressed as a percentage.

$$\%total = \frac{part}{total} \times 100$$

*Example:* totl%pr(200,20)=10

## tot%p, totl%p(total, %total)

Get a part of *total*, according to percent of the total *(%total)*.

$$part = \frac{total \times \%total}{100}$$

*Example:* totl%p(200,20)=40

## tot%t, totl%t(part, %total)

Get a *total* value according to its *part* and percent of this part relative to total *(%total)*.

$$total = \frac{part}{\%total} \times 100$$

*Example:* totl%t(40,20)=200

## mc%m, mc%m(price, cost)

The difference between *price* and *cost*, expressed as a percentage of cost.

$$markup = \frac{price - cost}{cost} \times 100$$

*Example:* mc%m(220,200)=10

## mc%p, mc%p(markup, cost)

Get *price* value according to *cost* and *markup* as a percentage of cost

$$price = \frac{(100 + markup) \times cost}{100}$$

*Example:* mc%p(10,200)=220

## mc%c, mc%c(markup, price)

Get a *cost* value according to *price* and *markup* as a percentage of cost.

$$cost = \frac{price}{100 + markup} \times 100$$

*Example:* mc%c(10,220)=200

## mp%m, mp%m(price, cost)

The difference between *price* and *cost* expressed as a percentage of the price.

$$markup = \frac{price - cost}{price} \times 100$$

*Example:* mp%m(200,180)=10

## mp%p, mp%p(markup, cost)

Get *price* value according to *cost* and *markup* as a percentage of the price.

$$price = \frac{-cost}{markup - 100} \times 100$$

*Example:* mp%p(10,180)=200

## mp%c mp%c(markup, price)

Get *cost* according to *price* and *markup* as a percentage of the price.

$$cost = \frac{(markup - 100) \times price}{-100}$$

*Example:* mp%c(10,200)=180

# Statistics calculations.

Choose ‘Statistics’ in category menu.

| | | | |
|---|---|---|---|
| STAT | nrmpdf | tpdf | chi2pdf |
| invnrm | nrmcdf | tcdf | chi2cdf |
| | | | NEXT |

| | | | |
|---|---|---|---|
| binpdf | poispdf | | PREV |
| bincdf | poiscdf | | |
| | | | |

## *Statistics.*

REGR

The “Statistics” worksheet is used to analyze sets of numbers. The following calculations and analyses are available.

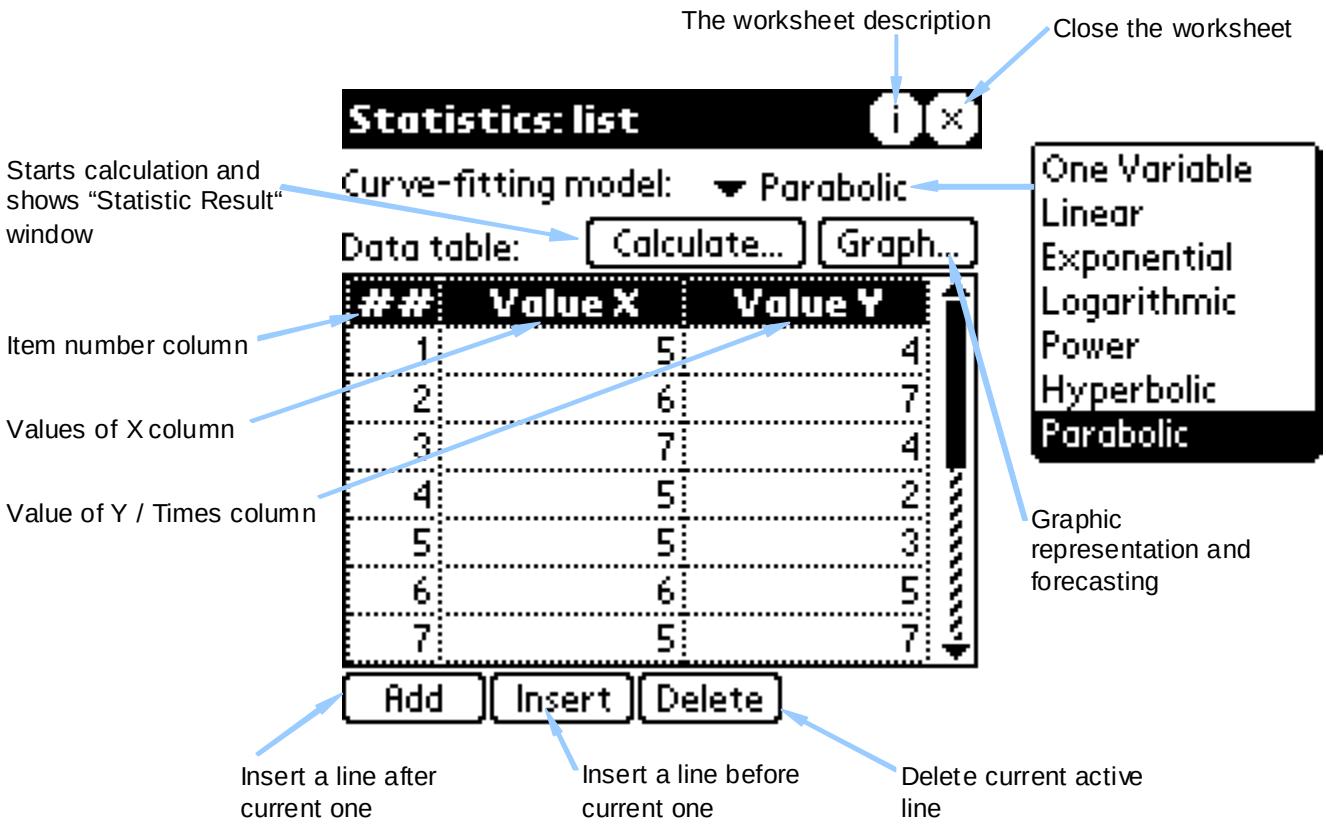
**For one variable statistical data row:**

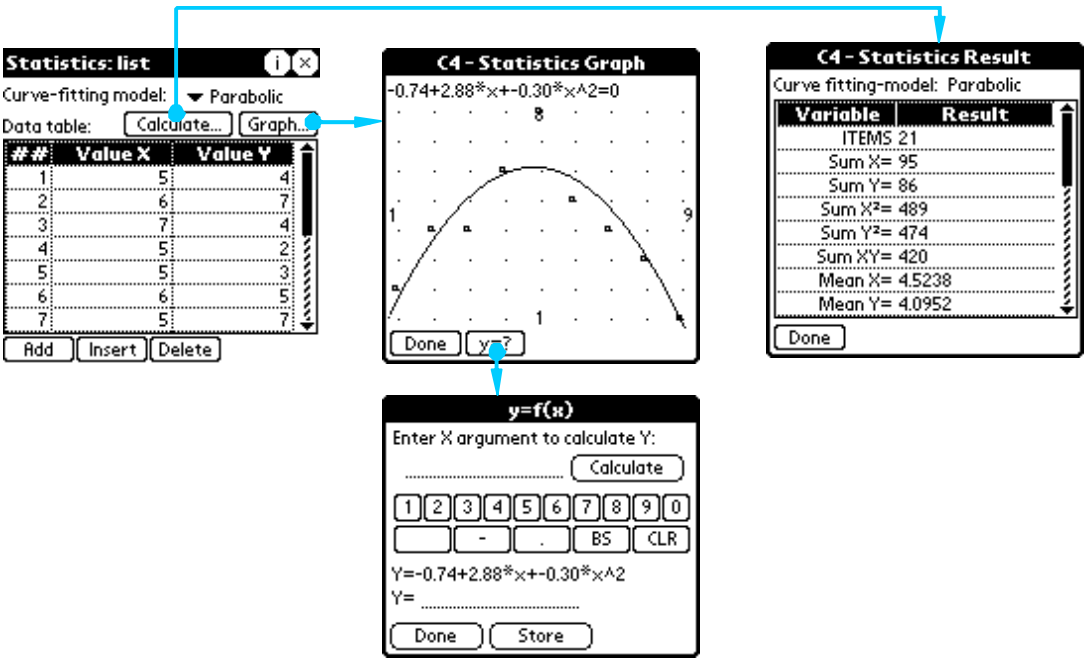
- total number of items
- a sum of squares
- mean
- maximum and minimum
- range
- standard deviation
- standard deviation of a discrete random variable
- median
- mode

**For two variables (*x*, *y*) statistics data row:**

- 6 multiple regression models (linear, exponential, logarithmic, power, hyperbolic, parabolic) and analysis for the purpose of prediction
- graphic representation of each of the models
- $\sum x$, $\sum y$, $\sum x^2$, $\sum y^2$, $\sum xy$
- mean *x* and *y*
- maximum *x* and *y*, minimum *x* and *y*
- range *x* and *y*
- standard deviation *x* and *y*
- weighted mean

### *Statistics worksheet.*




### *Create new Statistics list.*

In order to create a new data list you have to open application menu Option→New. You will be asked for a name for the new worksheet name.

Enter a name, up to 11 symbols.

Your current worksheet will be saved automatically. If you do not need it, open worksheet list ( Option →Open… ) and delete it.

When you start the Statistics worksheet for the first time after installation, you should define a name of the first data list before it starts.

### *Load existing worksheet.*

In order to load an existing worksheet, go to Option →Open…. Choose the name you need and tap the "Open" button. The list will be loaded.

### *Calculations.*

1. Prior to any calculation define the curve-fitting model.
2. Fill out cells in the input data table.
3. Tap button "Calculate…" and the result will appear in C4-Statistics Result window. Tap "Graph…" to see a graphic representation of the set of data you've entered and play with the computed model (forecasting , tap "y=?" button)

### *Regression models and analysis.*

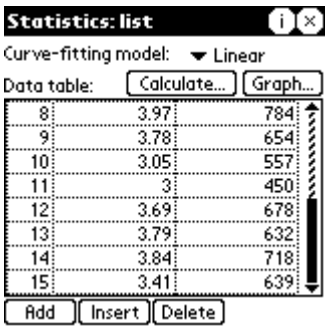
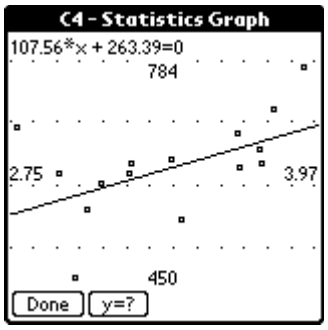
Regression analysis is used primarily for the purpose of prediction. Correlation analysis, in contrast to regression, is used to measure the strength of the association between numerical variables. The nature of the relationship can take many forms, ranging from simple ones to extremely complicated mathematical functions. Currently C4Finance maintains 6 multiple regression (or curve-fitting) models.

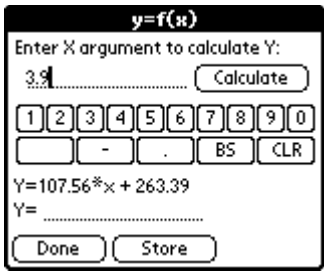
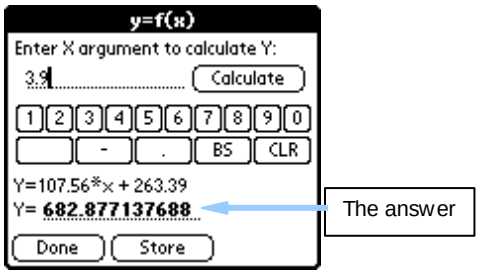
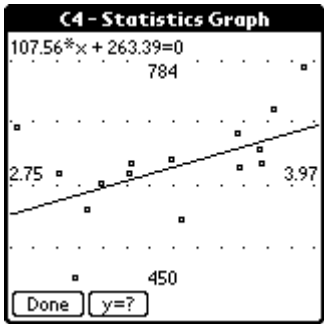
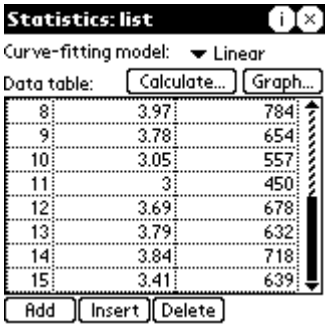
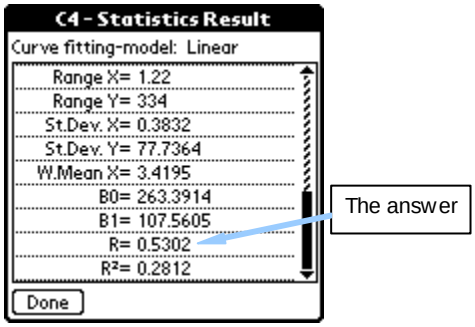
| | |
|---|---|
| **Linear** | $y= B0+B1x$ |
| **Exponential** | $y=B0\,e^{B1x}$ |
| **Logarithmic** | $y= B0+B1\ln(x)$ |
| **Power** | $y=B0\,x^{B1}$ |
| **Hyperbolic** | $y=B0+B1/x$ |
| **Parabolic** | $y=B0+B1x+B2\,x^2$ |

### *Examples.*

Based on statistical data of undergraduate GPA, try to predict the future GMAT score for a GPA 3.9. Use the linear curve-fitting model. How strong is the relationship between GPA and GMAT score?

| ## | Undergraduate GPA | GMAT Score |
|---|---|---|
| 1 | 2.93 | 617 |
| 2 | 2.75 | 688 |
| 3 | 3.24 | 632 |
| 4 | 3.23 | 616 |
| 5 | 3.11 | 599 |
| 6 | 3.45 | 542 |
| 7 | 3.70 | 624 |
| 8 | 3.97 | 784 |
| 9 | 3.78 | 654 |
| 10 | 3.05 | 557 |
| 11 | 3.00 | 450 |
| 12 | 3.69 | 678 |
| 13 | 3.79 | 632 |
| 14 | 3.84 | 718 |
| 15 | 3.41 | 639 |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Fill out the worksheet according to the problem. |  | |
| Tap “Graph…” button |  | Look at the graphical data set representation and function of the linear model. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “y=?” button, and enter 3.9 |  | Open forecasting panel and enter required GPA |
| Tap “Calculate” button. |  | Get a prediction of GMAT score for GPA 3.9 |
| Tap “Done” |  | Close “y=*f*(x)” window |
| Tap “Done” |  | Close “C4-Statistics Graph” window |
| Tap “Calculate…” and scroll table down. |  | Gets correlation coefficient that shows how strong is relationship between GPA and GMAT score. R=0.5302 |

***Distribution functions.***

Note. Decimal place value is 4 for all of the examples for this section.
(application menu, Option → Precision…)

*In order to see a graph in the Graphics Explorer, for example y(x)=normpdf(x, 0, 1), you should do the following steps:*

*1. From Main Screen go to the Equation Solver (select it from category menu).*
*2. Enter worksheet name and tap "Done"*
*2. Tap "Equation:" field, the Equation Editor window will be opened.*
*3. Enter an equation you want in "Equal to Zero" format, for example: "normpdf(x, 0, 1)=0".*
*4. Tap 'Done' button.*
*5. Check that one of the variable ('x' for our example) in the "Variables:" list is empty (doesn't have any value).*
*6. Tap "Graph…" button..*
*7. Now you should set zoom to see the graph. (For the example above tap once arrow up button, 5 times "Zoom +" and 3 times "AxisY +")*
*Zoom:*
*X1= -3.125*
*X2=3.125*
*Y1= -0.15625*
*Y2=0.625*

*8. You should see the graph.*

## nrmpdf, normpdf(x, $\mu$ , $\sigma$ ) ; $\sigma$ >0

X – specified value, real number.

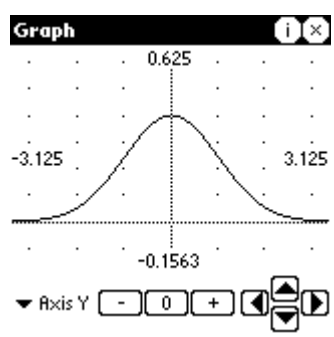
$\mu$ - mean.

$\sigma$ - standard deviation.

Returns the probability density for the normal distribution for 'x' value.

Example: normpdf(3, 4, 2) = 0.176

y(x)=normpdf(x, 0, 1);
X1= -3.125
X2=3.125
Y1= -0.15625
Y2=0.625



## nrmcdf, normcdf(x, $\mu$ , $\sigma$ ) ; $\sigma$ >0

x – specified value, real number.

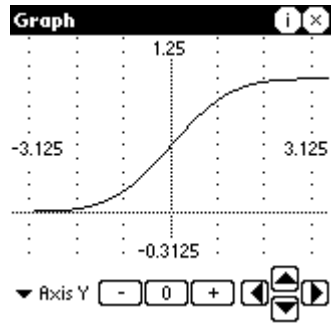
$\mu$ - mean.

$\sigma$ - standard deviation.

Returns the cumulative probability density for the normal distribution, from '–infinity' to 'x' value.

Example: normcdf(3, 4, 2) = 0.3085

y(x)=normcdf(x, 0, 1);
X1= -3.125
X2=3.125
Y1= -0.3125
Y2=1.25




## invnrm, invnormcdf(p, $\mu$ , $\sigma$ ) ; 0 < p < 1, $\sigma$ >0

p – probability.

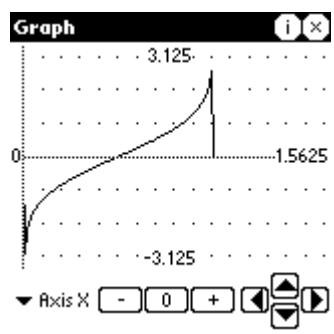
$\mu$ - mean.

$\sigma$ - standard deviation.

Returns the inverse cumulative probability distribution.

Example: invnormcdf(0.5, 3, 2) = 3

y(x)=invnormcdf(x, 0, 1);
X1= 0
X2=1.5625
Y1= -3.125
Y2=3.3125




## tpdf, tpdf(x, d) ; d>0

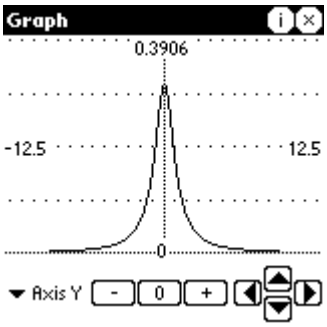
x – specified value, real number.

d – degrees of freedom.

Returns the probability density for the Student's ***t*** distribution, for 'x' value.

Example: tpdf(4, 2) = 0.0131

y(x)=tpdf(x, 1);
X1= -12.5
X2=12.5
Y1= 0
Y2=0.3906




## tcdf, tcdf(x, d) ; d>0

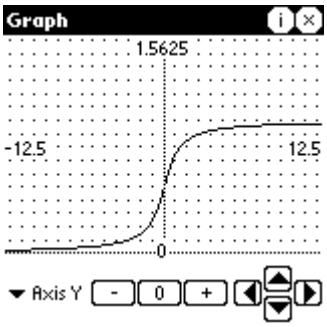
x – specified value, real number.

d – degrees of freedom.

Returns the cumulative probability density for the Student's ***t*** distribution, from '–infinity' to 'x' value.

Example: tcdf(4, 2) = 0.9714

y(x)=tcdf(x, 1);
X1= -12.5
X2=12.5
Y1= 0
Y2=1.5625




## chi2pdf, chi2pdf(x, d) ; x>0, d>0

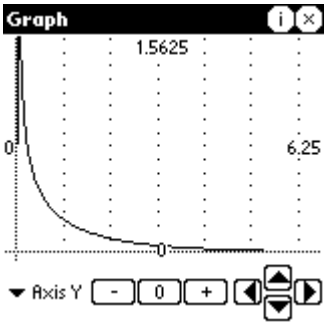
x – specified value.

d – degrees of freedom.

Returns the chi-squared distribution for 'x' value.

Example: chi2pdf(2, 5) = 0.1384

y(x)=chi2pdf(x, 1);
X1= 0
X2=6.25
Y1= 0
Y2=1.5625



## chi2cdf, chi2cdf(x, d) ; x>0, d>0

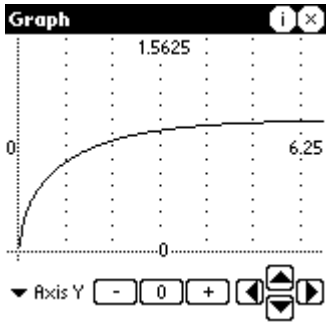
x – specified value.

d – degrees of freedom.

Returns the cumulative probability density for the chi-squared distribution, from '-infinity' to 'x' value.

Example: chi2cdf(2, 5) = 0.1509

y(x)=chi2cdf(x, 1);
X1= 0
X2=6.25
Y1= 0
Y2=1.5625




## binpdf, binompdf(p, k, n) ; $0 \le p \le 1$, $0 \le k \le n$ .

p – probability of success.

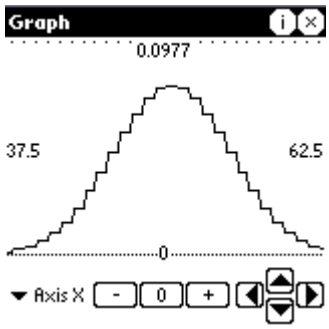
k – number of successes in the sample.

n – sample size.

Returns the probability density for the binomial distribution.

Example: binompdf(0.5, 40, 100) = 0.0108

y(x)=binompdf(0.5, k, 100);
X1= 37.5
X2=62.5
Y1= 0
Y2=0.0977




## bincdf, binomcdf(p, k, n) ; $0 \le p \le 1$, $0 \le k \le n$ .

p – probability of success.

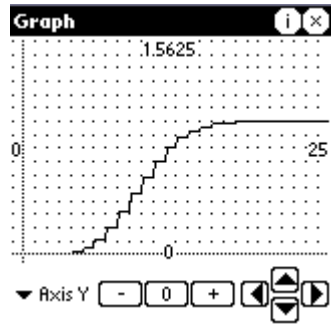
k – number of successes in the sample.

n – sample size.

Returns the cumulative probability density for the binomial distribution.

Example: binomcdf(0.5, 40, 100) = 0.0284

y(x)=binomcdf(0.1, k, 100);
X1= 0
X2= 25
Y1= 0
Y2= 1.5625




## poispdf, poissonpdf(x, $\lambda$) ; x>0, $\lambda$>0.

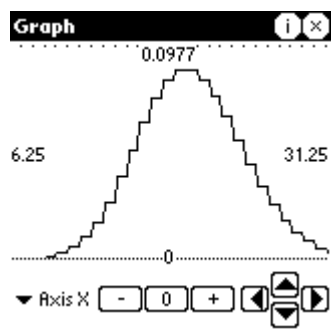
x – number of successes per unit (non-negative integer).

$\lambda$ – expected number of successes.

Returns the probability density for the Poisson distribution.

Example: poissonpdf(2, 4) = 0.1465

y(x)=poissonpdf(x, 20);
X1= 6.25
X2= 31.25
Y1= 0
Y2= 0.0977




## poiscdf, poissoncdf(x, $\lambda$) ; x>0, $\lambda$>0.

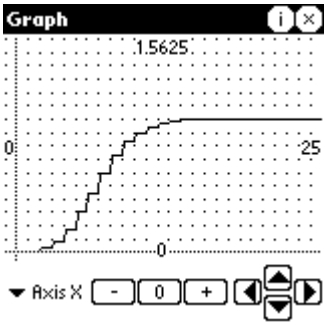
x – number of successes per unit (non-negative integer).

$\lambda$ – expected number of successes.

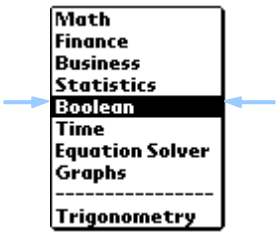
Returns the cumulative probability density for the Poisson distribution.

Example: poissonpdf(2, 4) = 0.2381

y(x)= poissoncdf(x, 7);
X1= 0
X2=25
Y1= 0
Y2=1.5625



# Boolean operators.




The Boolean (or logic) operators offer additional flexibility in your calculation. These operators can be used for comparing two values or equations.
Results of any Boolean operations are 1 *(TRUE)* or 0 *(FALSE)*, always. In calculations any non-zero number is considering as TRUE, zero is considering as FALSE.
For example: 5 and 6 = 1 or *(TRUE)*, 5 and 0 = 0 *(FALSE)*

The following Boolean operators are available.

< , > - **Less Than** or **Greater Than**.
Examples: (a<b)*(b-a) the result more or equal to zero.
(a>b)*(b-a) the result less or equal to zero.

<= , >= - **Less Than or Equal To** or **Greater Than or Equal To**.
Example: a<=b, a>=b

eq - **Equal to**. Compares two values or expression.
Ex: a eq b

<> - **Not equal to**.
C4 recognizes "><" as "<>", however it is not recommended to use.
Example: a<>b; a><b

not - Performs **logical negation** on an expression.
Example: b= not a *(for a=1 b=0; for a=0 b=1; for a={any number ≠ 0} b=0)*

and - Performs a **logical conjunction** on two expressions.
Ex: a and b

**Result Table for AND:**

| | a=0 | a ≠0 |
|---|---|---|
| b=0 | 0 | 0 |
| b ≠0 | 0 | 1 |

or - Performs a **logical disjunction** on two expressions.
Ex: a or b

**Result Table for OR:**

| | a=0 | a ≠0 |
|---|---|---|
| b=0 | 0 | 1 |
| b ≠0 | 1 | 1 |

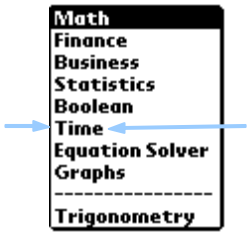
xor - Performs a **logical exclusion** on two expressions.
Ex: a xor b

**Result Table for XOR:**

| | a=0 | a ≠0 |
|---|---|---|
| b=0 | 0 | 1 |
| b ≠0 | 1 | 0 |

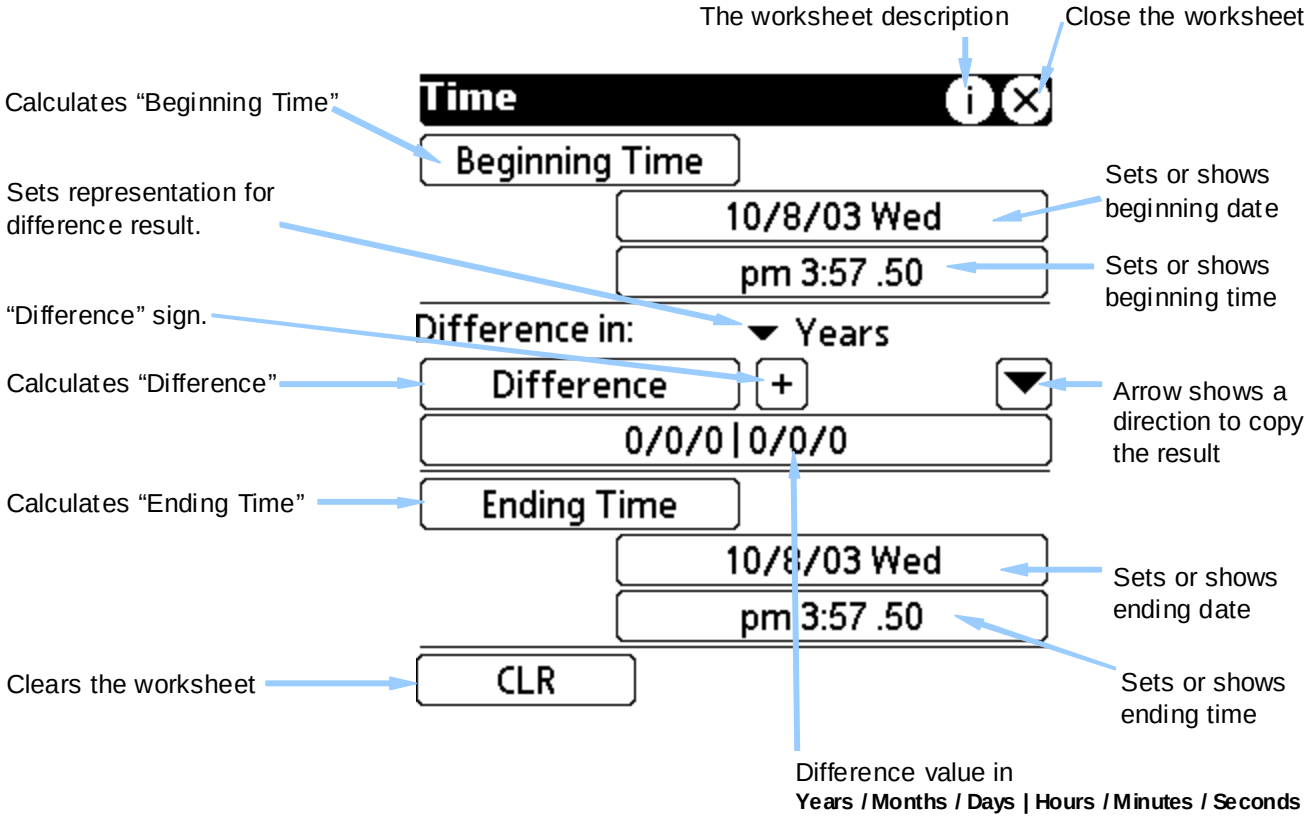
# Time calculations.

Choose ‘Time’ in category menu.




The Time worksheet performs calculations based on the real calendar. Time in this worksheet is inseparably linked from seconds to years. For example, if you calculated how many years are left to your retirement from today, you can easily get how many seconds it is.

### *Time worksheet.*




### *Calculations.*

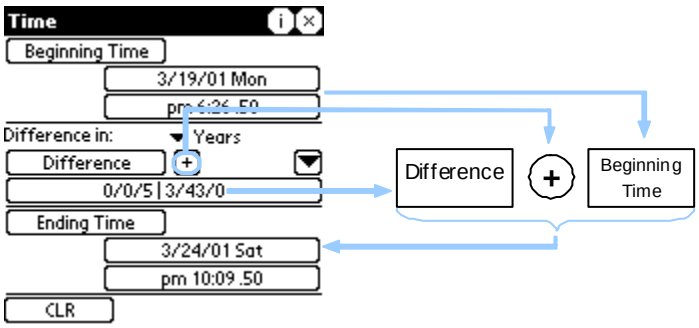
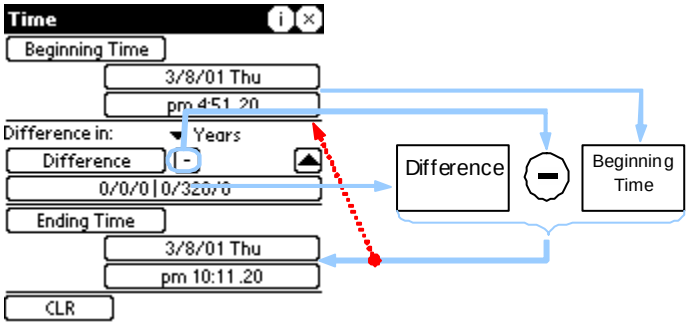
1. Set two of three parameters. (Beginning Date, Ending Date, Difference)
2. Set “Difference” sign if you calculate Beginning or Ending Date (i.e. use “Difference” in calculations)

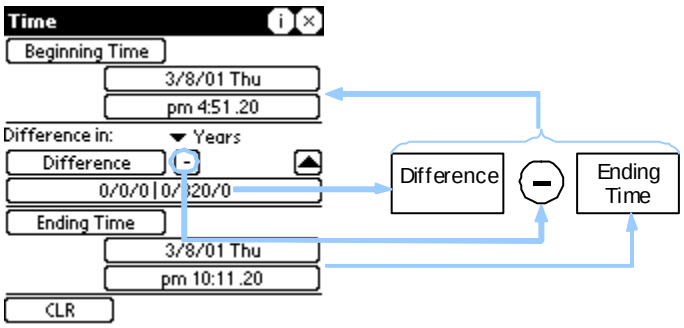
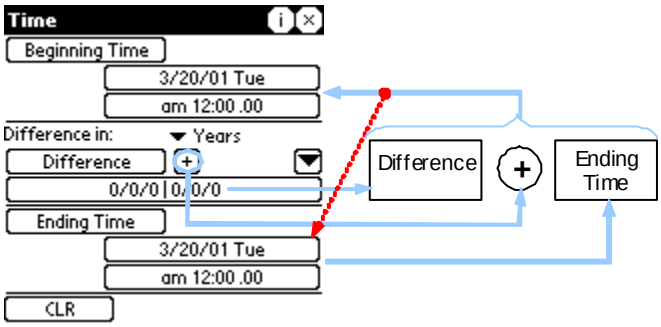
3. Set direction to put result if you calculate Beginning or Ending Date.
4. Set representation look if you calculate difference.
5. To get result tap the corresponding button (one of the following: “Beginning Time”, “Difference”, “Ending Time”)

### *Order of calculations.*

By using the arrow (‘▼’ or ‘▲’) and “Beginning Time”, “Difference”, “Ending Time” buttons you can set the order of calculations and where to copy the result. The arrow gives you additional flexibility in placing the result after a calculation. Look at the schemes below to understand how to use the arrow buttons.

This button will be useful if you do a chain of calculations, where each result depends on previous calculations.

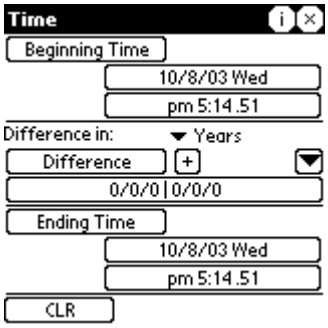
| Arrow’s Direction | Pressed Button | Calculation Scheme | Description |
|---|---|---|---|
| ▼ | **Ending Time** |  | This is a standard scheme.<br>Adds difference to Beginning Time (date and time) and puts the result in Ending Time register. |
| ▲ | **Ending Time** |  | This is an extended scheme.<br>Everything is similar to the previous standard scheme, however now it copies Ending Time (date and time) to Beginning Time. |
| | | | |

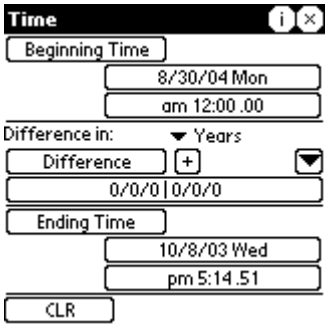
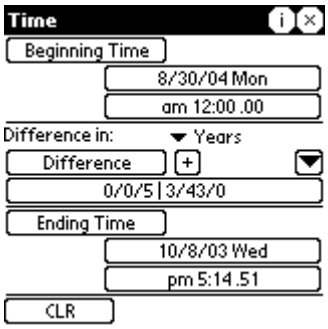
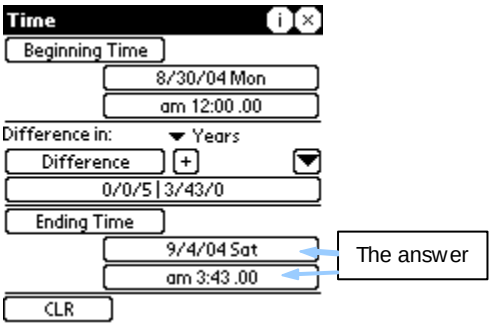
| | | | |
|---|---|---|---|
| | **Beginning Time** |  | This is a standard scheme. Subtracts difference from Ending Time (date and time) and puts the result in Beginning Time register. |
| | **Beginning Time** |  | This is an extended scheme. Everything is similar to the previous standard scheme, however now it copies Beginning Time (date and time) to Ending Time. |

***Examples.***

**Calculating "Ending Time".**

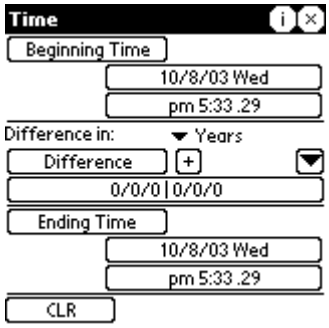
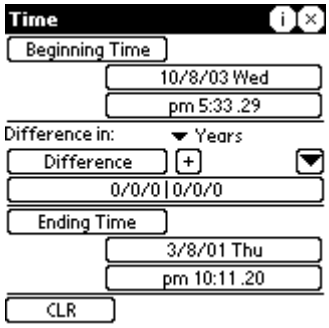
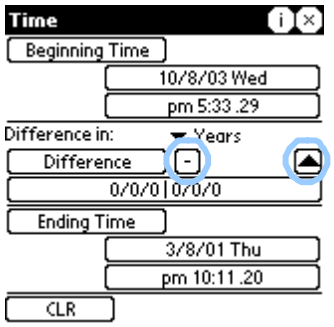
What date and time will be after 5 days 3 hours and 43 minutes from August 30, 2004, 12:00 am ?

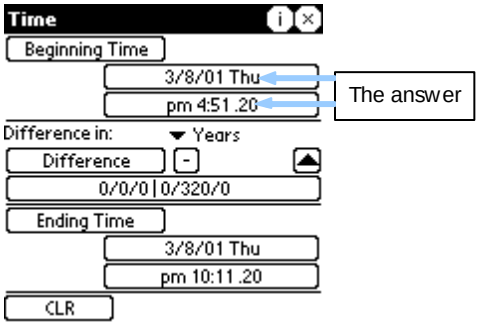
| **Keys/Actions:** | **Display:** | **Description:** |
|---|---|---|
| Tap "CLR" |  | The look depends on what date today is. Suppose now is October 8, 2003, pm 5:14 .51 |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Set the beginning time according to the problem |  | |
| Tap difference button '**0/0/0\|0/0/0**' then enter 5 days, 3 hours and 43 minutes. | | Enter a difference from the current date. |
| Tap "Done" |  | Go back to the "Time" worksheet. |
| Tap '**Ending Time**' |  | Get the answer.<br>Time after 5 days 3 hours and 43 minutes from August 30, 2004, 12:00 am is September 4, 2004, 3.43am |

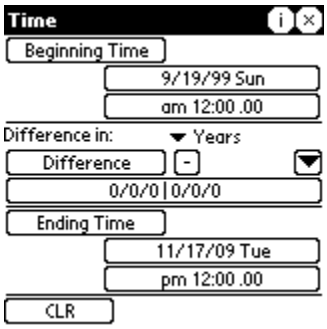
**Calculating "Beginning Time".**

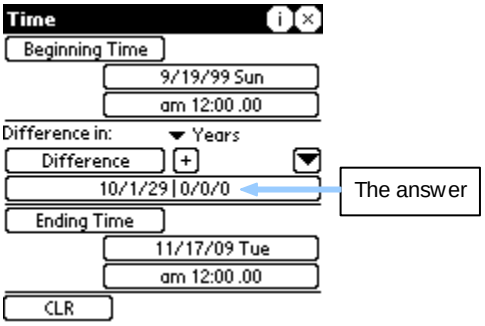
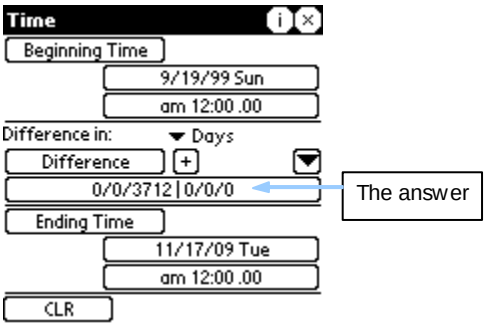
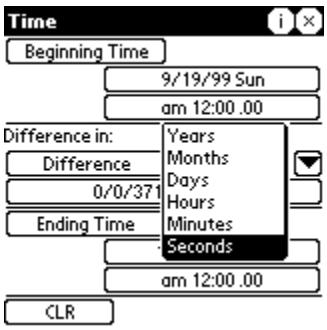
Calculate date and time 320 minutes before March 8, 2001 pm 10:11 .20.

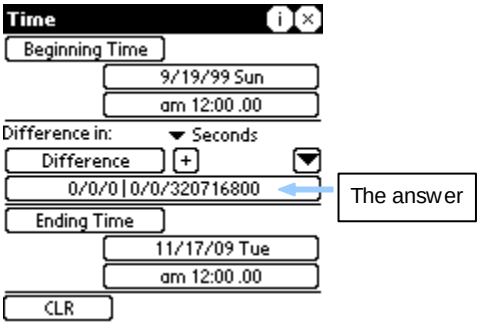
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” |  | The look depends on what date today is. Suppose right now it is October 8, 2003, pm 5:33 .29 |
| Set the <u>Ending Time</u> to choose March 8, 2001, pm 10:11 .20 |  | Choose a date. |
| Tap ‘▼’ to change the arrow’s direction. Also, tap ‘+’ to change the sign. |  | ‘-’ needs to perform subtraction from chosen time.<br>‘▲’ shows where to copy the result. Actually you do it to avoid copying Beginning Time to Ending time (in case of ‘▼’). |
| Tap ‘**0/0/0\|0/0/0**’ then set difference. Tap ‘Done’ to store the value. | | Sets the difference according to the problem |
| | | Ready to start calculation. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “Beginning Time” |  | The answer is March 8, 2001;<br>pm 4:51 .20 |

**Calculating “Difference”.**
What is the difference between September 19, 1999 and November 17, 2009? Also get it in days and seconds.

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “CLR” | | The look depends on what date today is. Suppose now it is March 21, 2001,<br>am 12:00 .00 |
| Enter both dates, September 19, 1999 as the beginning and November 17, 2009 as the ending. |  | Sets the first date and the second dates |

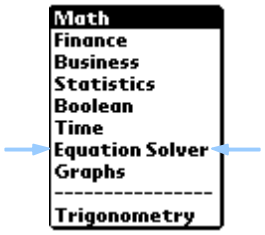
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “Difference” |  | The difference between September 19, 1999 and November 17, 2009 is 10 years, 1 month and 29 days. |
| Select ‘Days’ in the pop-up list. | | Now the difference will be presented in **Days \| Hours / Minutes / Seconds** format. |
| Tap “Difference” |  | The difference between September 19, 1999 and November 17, 2009 is 3,712 days. |
| Select ‘Seconds’ in the pop-up list. |  | Now the difference will be presented in seconds. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “Difference” |  | The difference between August 30, 1999 and September 1, 2002 is 94,867,200 seconds. |

In the example above, the arrow’s direction (‘▼’ or ‘▲’) does not matter. The ‘**+**’ sign shows that the difference between the Ending Date and the Beginning Date is positive.

# Equation Solver.

Choose ‘Equation Solver’ in category menu.

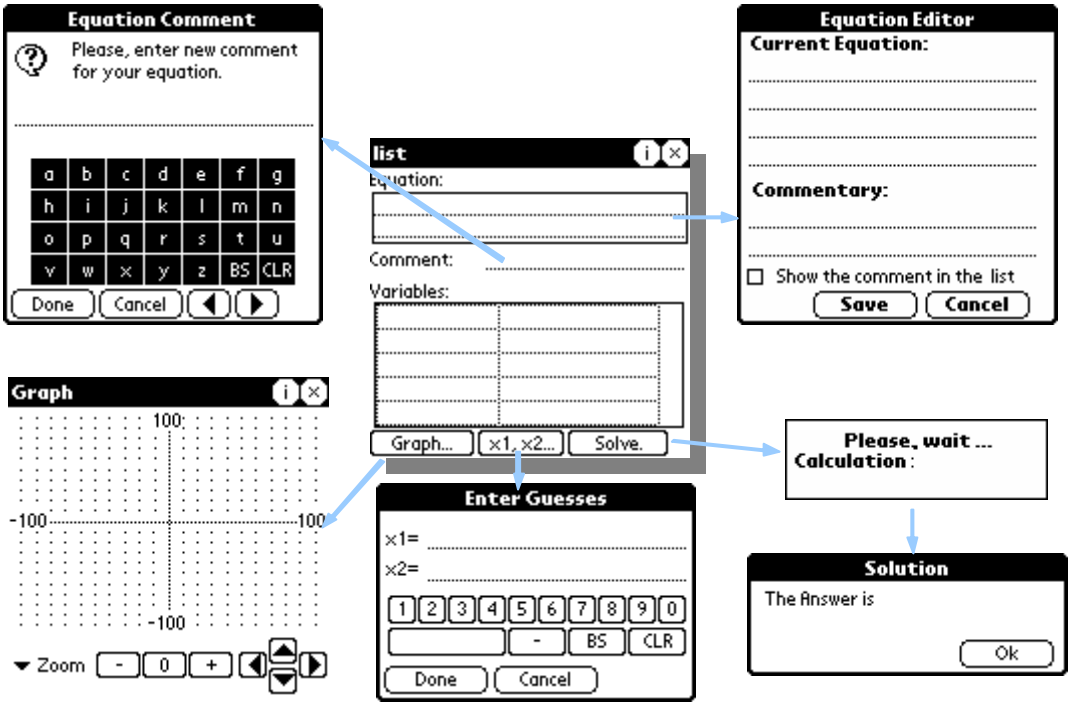



The Equation Solver worksheet performs calculations with custom equations and formulas in algebraic form. It lets you find the answer for any unknown variable of the equation you have entered. The solver lets you store your equations (up to 40).

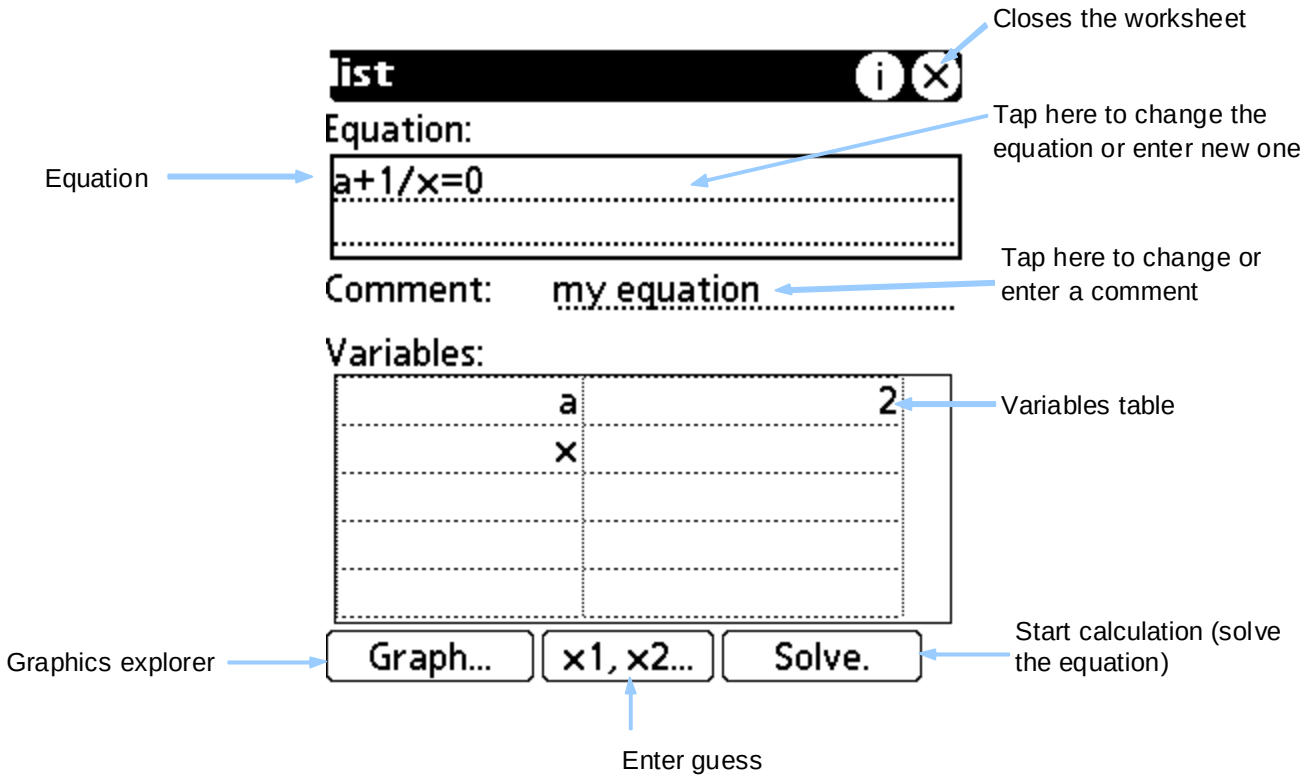
### *Equation Solver worksheet.*

The equation solver consists of three components

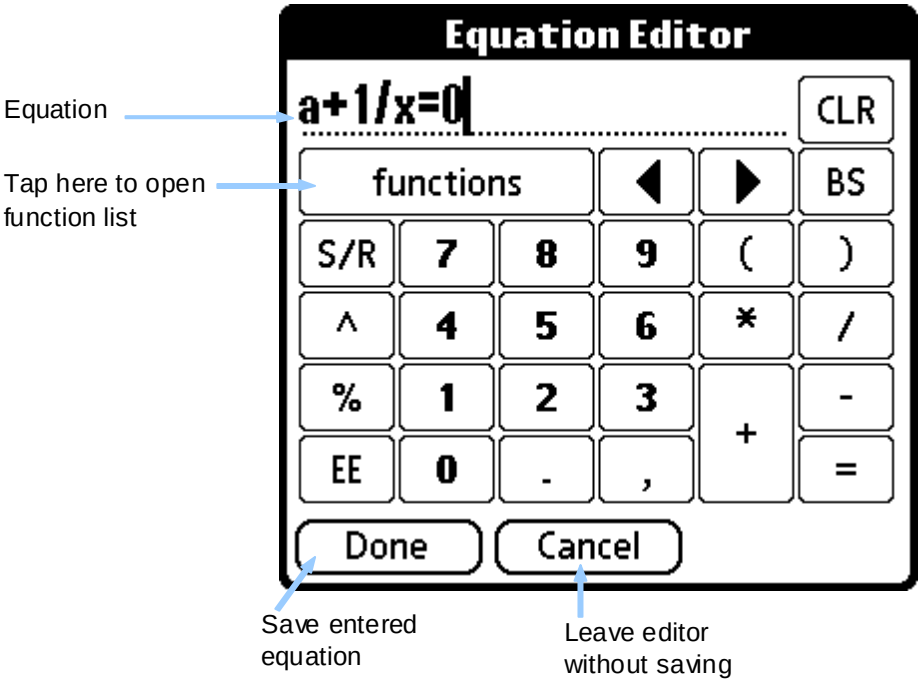
- **Main Form** is the central part. It lets you store and load equations, enter variables, set parameters and go to other components.
- **Equation Editor** is the part to enter equations.
- **Graphics Explorer** is the part that allows you to set calculation parameters for the Equation Solver; also it lets you explore the graph of the equation.



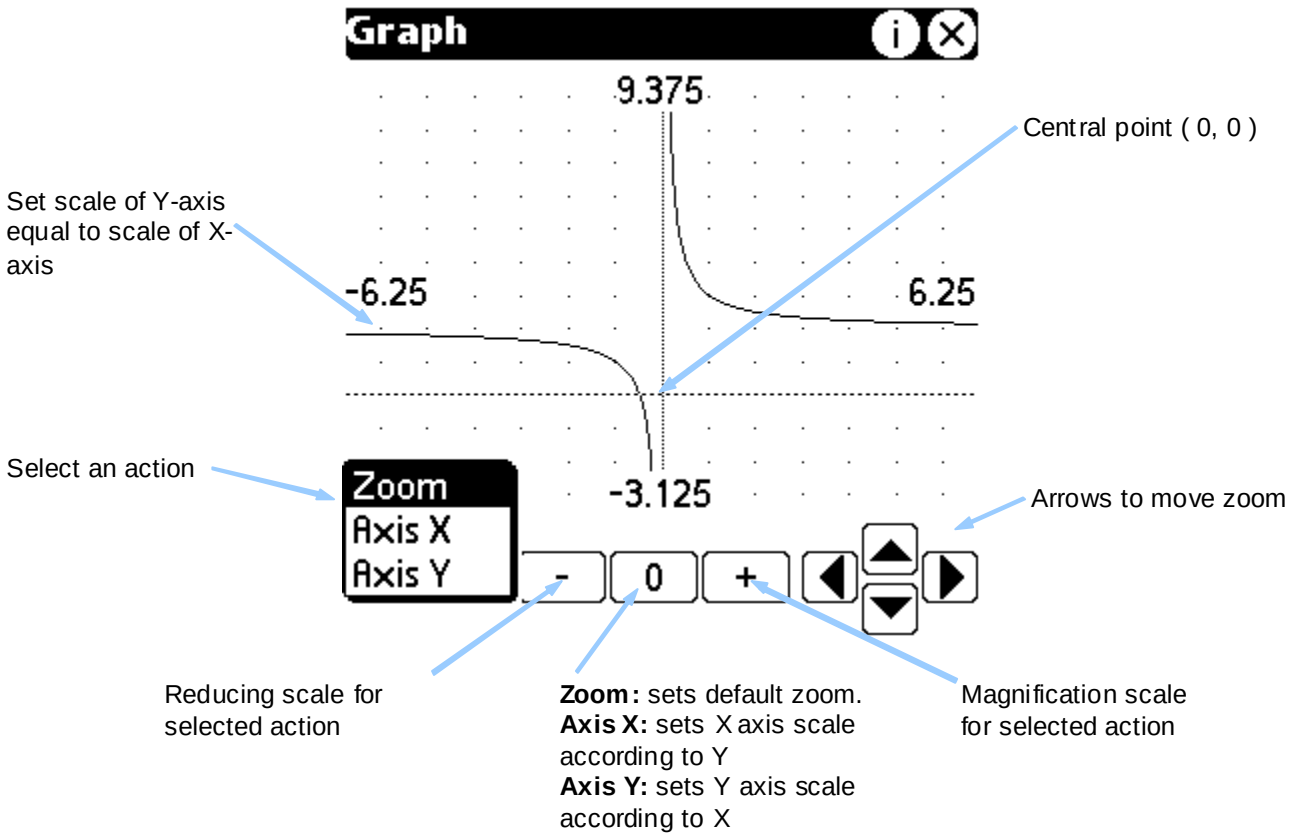
### *Main Form*




### *Equation Editor*




### *Graphics Explorer*




### *Calculations.*

1. Enter an equation or formula. Tap “Equation:” field to open Equation Editor.
2. Save an equation and go to the Main Form, tap “Done” button in Equation Editor.
3. Enter or edit value of each known variable. All variables except the unknown one must contain a value.
4. Enter an initial guess for the variable for which you are solving (“x1,x2…” button). It is optional, but would be very helpful to find a solution more quickly. Also, the guess is necessary if the equation has more than one root and you want to find only one certain root. You can use Graphics Explorer to define a range for the guess (“Graph…” button).
5. Tap “Solve.” button to start calculation and find an answer.
6. You can tap screen to interrupt long calculation.

### *How Equation Solver works. Limitations.*

Equation Solver uses two methods to find solutions. Choosing a method depends on the complexity of the equation. Initially the solver tries to find a *direct* solution (or symbolic solution) if the attempt is not successful the solver tries to find *iterative* solution.

The direct method tries to calculate the unknown variable by rearranging the equation. The unknown variable is moved to one side of the equation, known variables to the other side. For example, you’ve entered the equation:

$$A + B = C.$$

If ‘B’ is a variable you are solving for, Equation Solver rearranges internally the equation to

B=C-A.

Answers calculated this way are called *direct* solution. This method is absolutely exact and usually does not take a lot of time. However, a direct solution cannot always be found. For example:

$$E = \left(1 + \frac{A}{X}\right)^X \text{; there is no symbolic solution for X}$$

Also, the solver cannot find a direct solution in case of more than one identical variable in the equation you have entered. For example: 2x+x=6.

If a direct solution was not found, the solver searches iteratively for it.

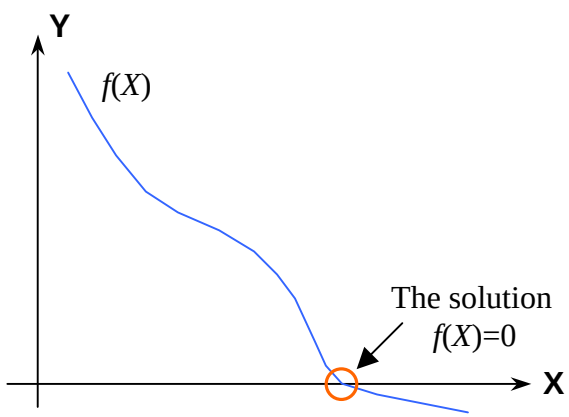
Initially the solver rearranges equation in “equal to zero” format. For example:

$$E = \left(1 + \frac{A}{X}\right)^X \Rightarrow \left(1 + \frac{A}{X}\right)^X - E = 0.$$

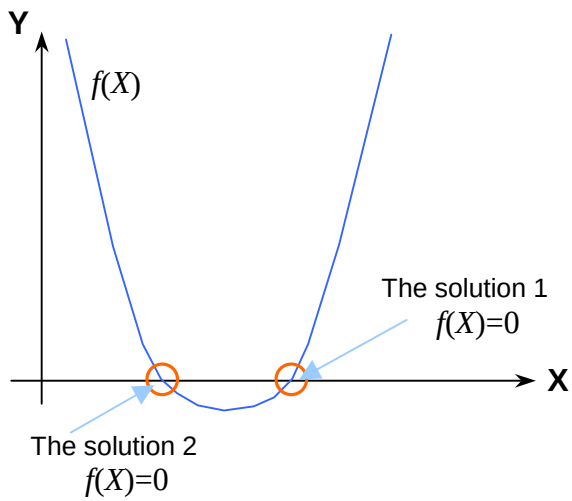
After that the solver transforms the equation to a function

$$f(X) = \left(1 + \frac{A}{X}\right)^X - E$$

and tries to find $X$ where $f(X)$=0. The $A$ and $E$ variables you should define before the computation. Graphically a solution looks like the intersection of $f(X)$ and the X-axis.




Keep in mind, there might be more than one solution to an equation.

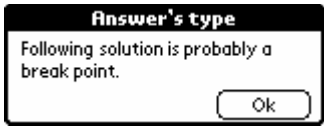



In the case of more than one solution to the equation, the solver stops when it finds any one of them. By defining new guesses and by using Graphics Explorer you can find the other solutions.

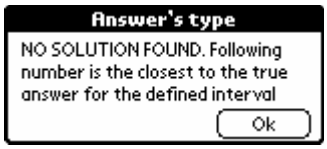
> **Notice.** Graphics Explorer is a tool that you can use to define guesses. When you work with Graphics Explorer you should localize the area with one and only one intersection of *f*(*x*) and the X-axis. When you tap the 'Ok' button in Graphics Explorer the X1 and X2 values of the explorer copy to variables that Equation Solver uses as your guesses. To see these variables tap '**x1,x2...**' in the Equation Solver worksheet. However, if you've entered guesses ('**x1,x2...**') and then go to Graphics Explorer, you will see that x1, x2 (guesses) were not copied to X1, X2 (explorer's X-range); the explorer uses its old values (or default).

The process of finding a solution iteratively is very complex and there is not a 100% guarantee that you will find an answer. There can be three possible outcomes.

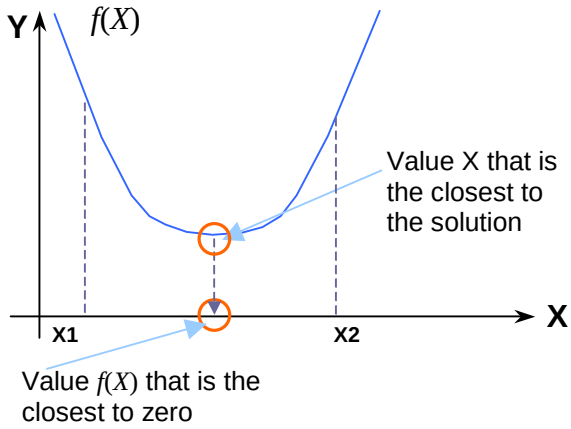
1. Equation Solver gives you a result and most probably the answer is a solution.
2. Equation Solver gives you a result and most probably the answer is a break point. The solver warns you in this case.



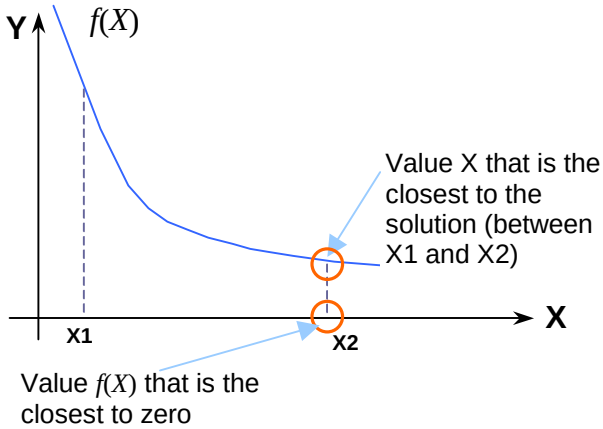

3. No solution was found; in this case the solver gives you a value, where $f(X) \neq 0$, but the closest to zero. The solver warns you in this case.




Example.



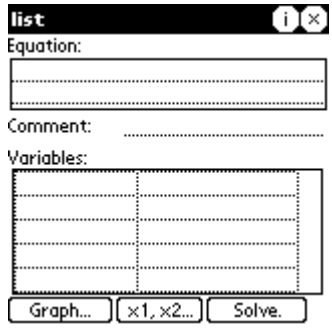

Example.

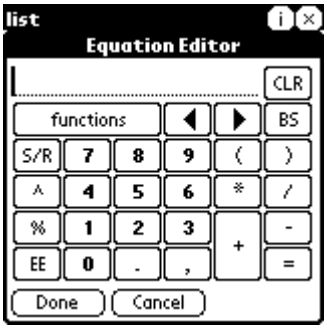
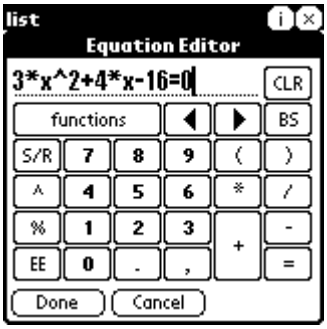
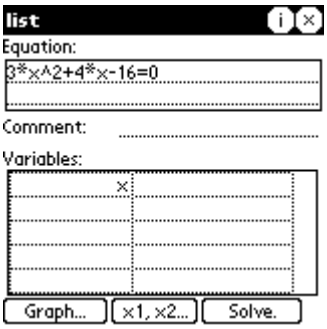
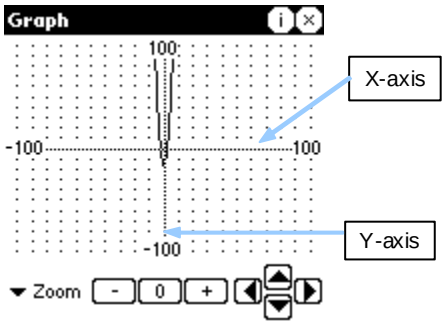


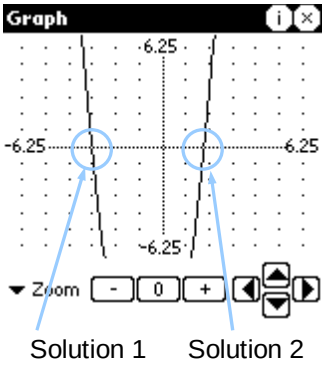
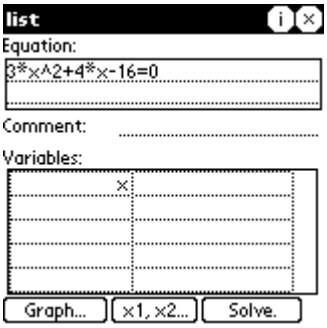
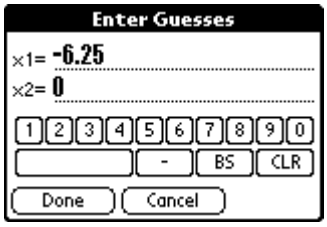
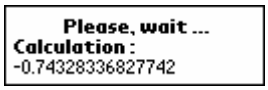
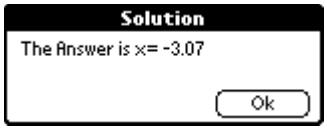
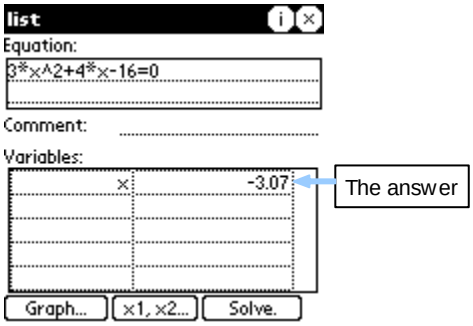

*f*(*X*) Precision of the equation solver is a constant value and for this version is 1E-11. If Equation Solver got function's value -1E-11< *f*(*X*) < 1E-11, it considers the value as zero, stops calculation and gives you an answer *X*. Note, *f*(*X*) precision does not mean precision of the answer *X*. The 1E-11 value was intentionally set not too small in order to find the answer as soon as possible.

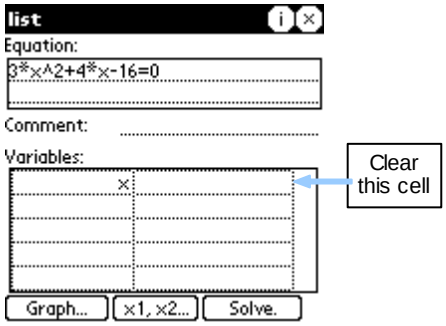
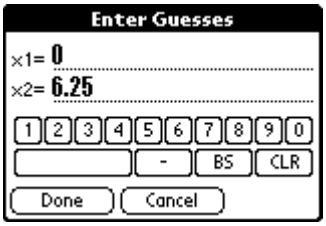
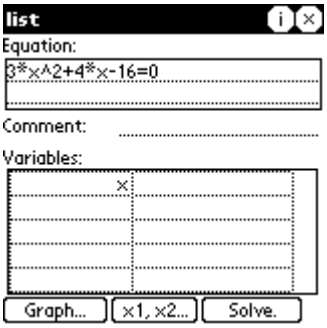
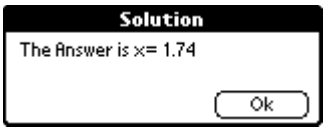
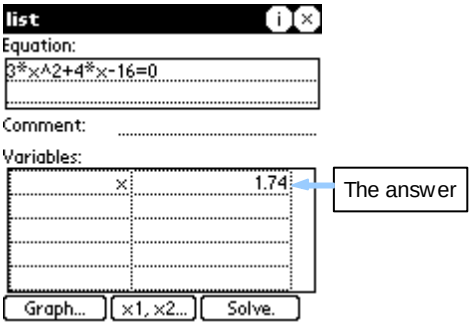
***Examples.***

**Equation.** Find both roots of the equation. $3x^2 + 4x - 16 = 0$

| Keys/Actions: | Display: | Description: |
|---|---|---|
| |   | Let start with new clear list. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap “Equation:” field to get the equation editor. |  | Go to Equation Editor, to enter new equation. |
| 3*x^2+4*x-16=0 |  | Enter equation $3x^2 + 4x - 16 = 0$ |
| Tap “Done” |  | Enter the equation and get the list of variables. |
| Tap “Graph…” |  | Go to Graphics Explorer. Here is a graph of the function $f(x) = 3x^2 + 4x - 16$. Intersections of f(x) and the X-axis are solutions. |

| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap "+" 4 times |  | Get close look of the graphic.<br>You see one of the solution in the range from 0 to -6.25, the second solution in the range from 0 to 6.25 |
| Close the window and return to the main Equation Solver form. For this example, tap "No" in the question window where left and right zoom borders could be assigned to x1 and x2 values. |  | |
| Tap "x1, x2…" to enter the first solution interval. |  | |
| Tap "Solve." To find the first solution |  | Performing calculation |
| |  | Get the first answer in the range from -6.25 to 0 |
| Tap 'Ok' to return to Main Form |  | |

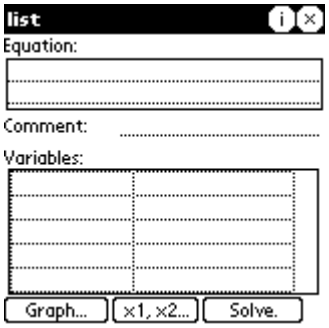
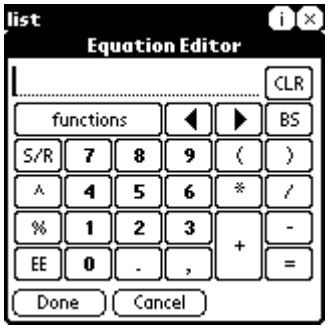
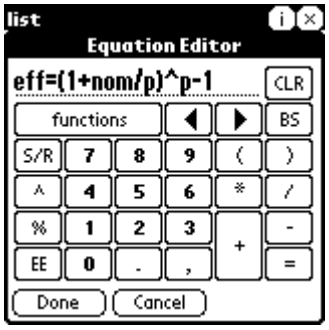
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Select the answer in variable list and clear the cell. |  | |
| Tap "x1, x2…" and enter the second solution interval |  | |
| Tap 'Done' |  | Now you are ready to start calculation for the second answer. |
| Tap "Solve." | | Performing calculation |
| Tap 'Ok' |  | Get the second answer. |
| |  | To get more precise answer, set the desired Decimal Place at Options→Precision. |

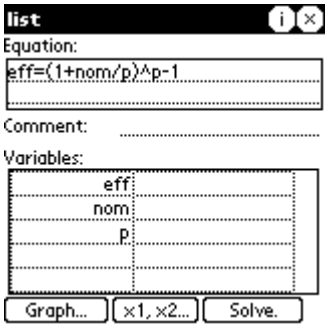
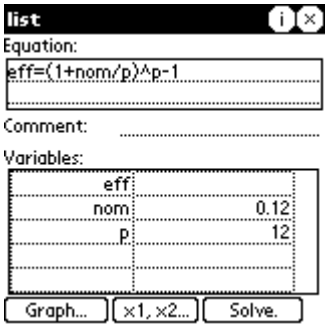
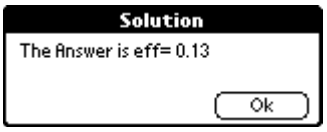
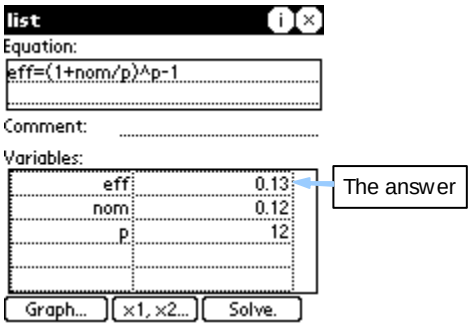
In the real problems you would better assign left and right border of the graph view zoom to x1, x2 values of the solver. The example above shows how to enter guesses.

**Formula.**

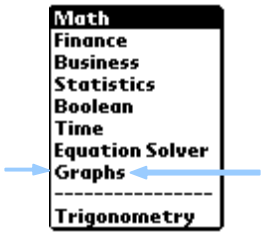
Suppose you are offered 12% compounded monthly. What is the effective rate?
The formula to calculate an effective rate is

$$eff = \left(1 + \frac{nom}{p}\right)^{p} - 1.$$

| Keys/Actions: | Display: | Description: |
|---|---|---|
| |  | Let's start with a new clear list. |
| Tap "Equation:" field to get the equation editor. |  | Go to Equation Editor, to enter new equation. |
| Enter the equation eff=(1+nom/p)^p-1, a commentary: "Effective rate", mark the check-box "Show the comment in the list" |  | |

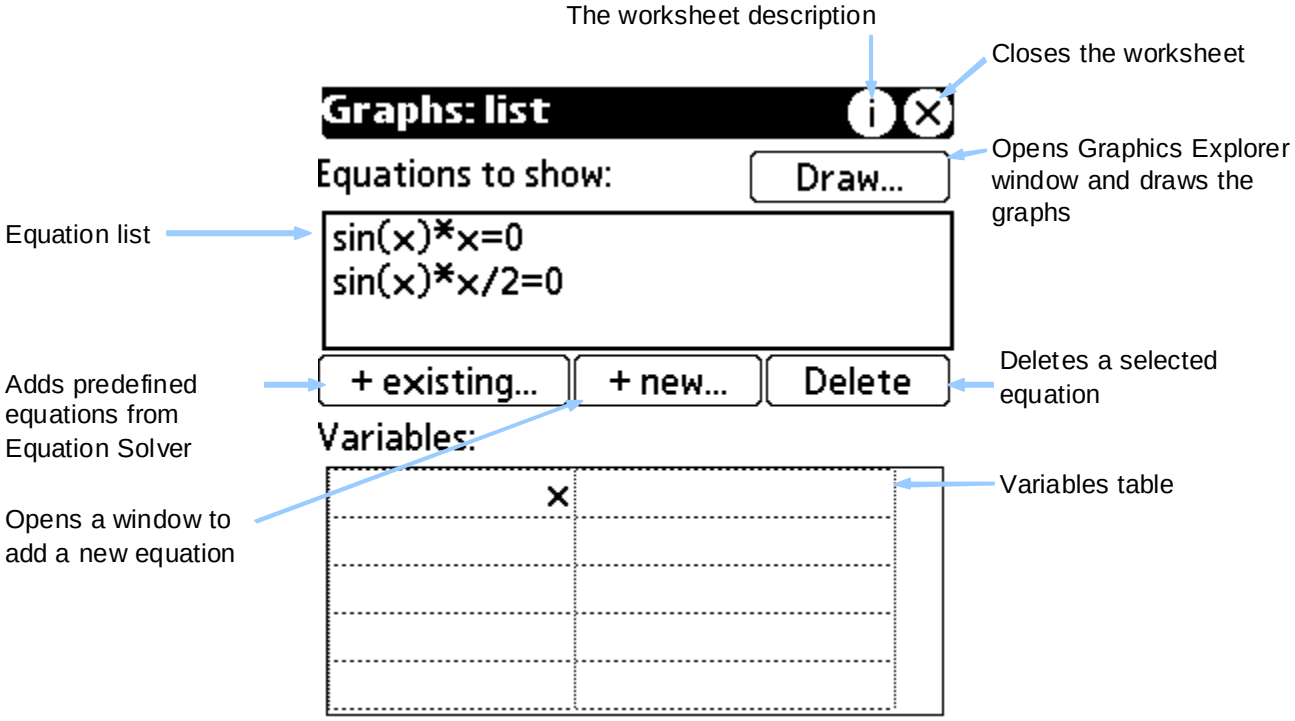
| Keys/Actions: | Display: | Description: |
|---|---|---|
| Tap 'Done' to store the equation, go to main Equation Solver form and get variables list. |  | |
| Enter nominal interest rate (nom) and number of periods (p) according to given problem. |  | nom=0.12 is 12% nominal interest rate. p=12 is number of periods (compounded monthly) |
| Tap "Solve." button |  | Calculate the answer. |
| |  | To get more precise answer, set the desired Decimal Place at Options→Precision. |

# Graphs.




This worksheet lets you define a list of equations to draw and explore them simultaneously. You can create, save and load the list. It is a manager for Graphics Explorer.

***Graphs worksheet.***




***Calculations.***

1. Create or edit the equation list, use “+new…”, “+existing…” or “Delete” buttons.
2. Enter or edit value of each known variable. All variables except the unknown one must contain a value.
3. Tap button “Draw…” to open Graphics Explorer window to view the defined graphs.

## Trigonometry.

Choose ‘Trigonometry’ in category menu.

| | | | |
|---|---|---|---|
| sin | cos | tan | |
| asin | acos | atan | |
| sinh | cosh | tanh | NEXT |

| | | | |
|---|---|---|---|
| asinh | acosh | atanh | PREV |
| | | | |
| | | | |

C4Finance gives you the ability to work with basic trigonometric and hyperbolic functions. You can use them in expressions, equations and formulas. Before using these functions set “Trigonometry Mode” in the application menu ( or →Options→Trigonometry Mode…) to either “Radians” or “Degrees”.

Trigonometric functions.

**sin**, sin(x) — sine.

sin(45)=0.70711

**cos**, cos(x) — cosine.

cos(0)=1

**tan**, tan(x) — tangent.

tan(20)=0.36397

**asin**, asin(x) — arcsine.

asin(0.3)=17.4576

**acos**, acos(x) — arccosine.

acos(0.25)=75.52249

**atan**, atan(x) — arctangent.

atan(0.1)=5.71059

**sinh**, sinh(x) hyperbolic sine.

sinh(0.6)=0.63665

**cosh**, cosh(x) hyperbolic cosine.

cosh(2)=3.7622

**tanh**, tanh(x) hyperbolic tangent.

tanh(2)=0.96403

**asinh**, asinh(x) hyperbolic arcsine.

asinh(14)=3.33348

**acosh**, acosh(x) hyperbolic arccosine.

acosh(27)=3.98864

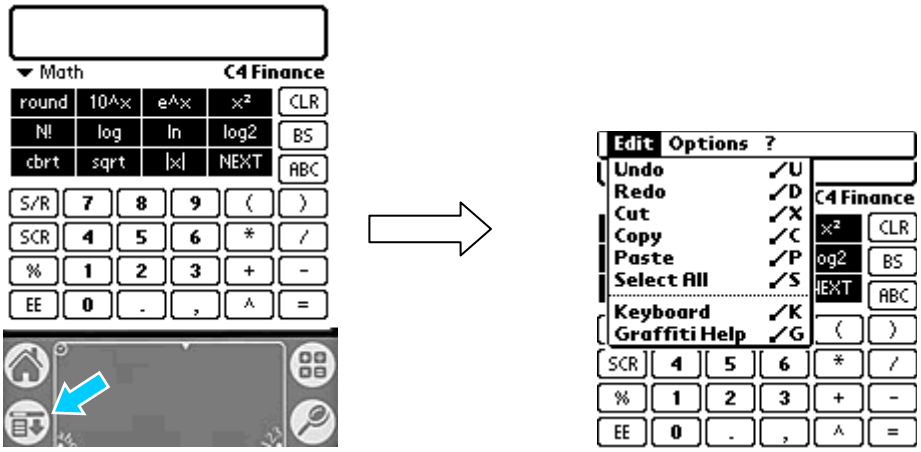
**atanh**, atanh(x) hyperbolic arctangent.

atanh(0.5)=0.54931

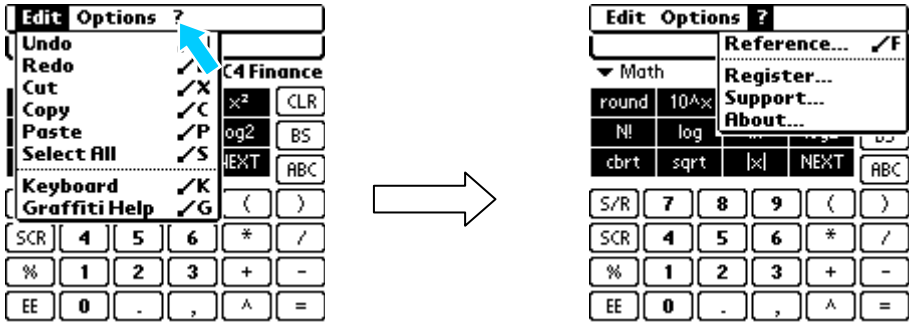
# Registration and unlocking your copy of C4.

In order to enter the license you've got after purchasing you should do the following steps:

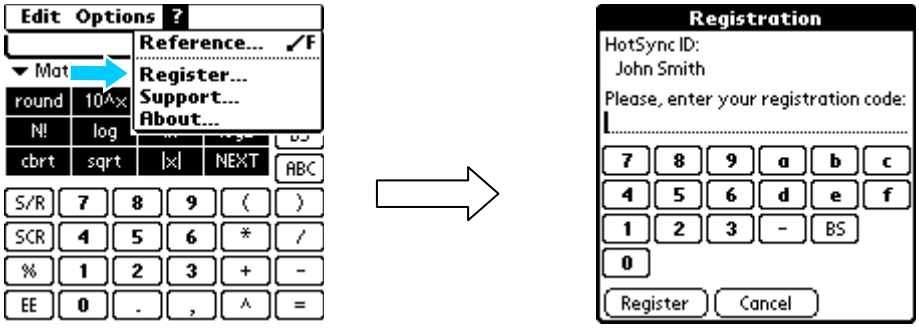
1. Start the C4 calculator.
2. Open the application "Menu".



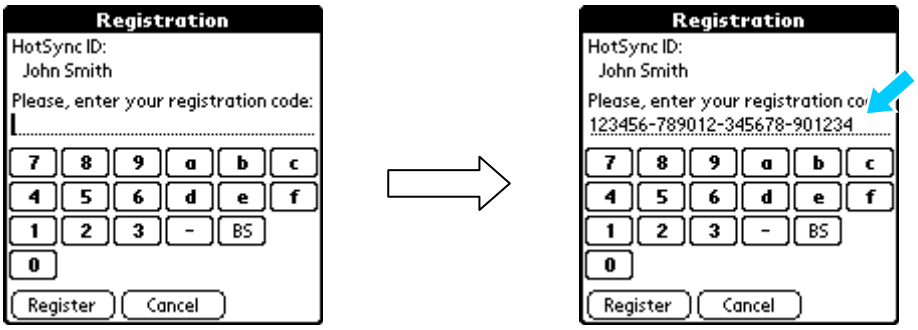

3. Tap "?".




4. Tap "Register...".



5. Enter your registration code.




6. Tap the “Register” button.

7. Tap “Ok” button. Your have entered the activation code and C4 calculator works without any limitations.

## Contacting C4Finance developers


- **Web**: www.c4calc.com
- **Email**: c4@perm.raid.ru
- **Mail**: Box 7360, Perm, Russia 614083.


## Credits.


**Dmitri Vokhmine** - project manager, interface, financial calculations.
**Evgueni Kholzakov** – calculator's engine, equation solver, math functions.


## Special thanks.


**Macdonald R. Phillips**
**Gary Kinsman**


## Purchasing C4.

C4Finance, C4Everyday licensing available at www.c4calc.com, www.handango.com, www.palmgear.com

PalmGear Ordering.
Ordering by phone: 1(817) 640 6558 (from 9 AM to 5 PM Texas Time, Monday through Friday).
Ordering by fax 1(817) 640 6614.

Volume discount is available, send request at c4@perm.raid.ru or contact with Handango representative.

C4Finance and C4Everyday are shareware products. You can use them up to 15 days without any limitations after that you have to buy an unlocking code and activate your copy of C4.

If you going to use C4Finance v1.19 or v1.19se, please, send you request after purchase, with HotSync name at c4@perm.raid.ru

# Index


***A***

abs ....19
Accelerated Cost Recovery System....36
acos....85
acosh....86
ACRS ....38
amortization schedule....23
answer is a break point ....77
answer is a solution ....77
asin ....85
asinh ....86
atan ....85
atanh ....86

***B***

Beginning Date....65, 72
binary....6, 11
binomcdf....62, 63
binompdf ....62
Black-Scholes....3, 6, 45, 47
bonds ....33, 34
Boolean....4, 6, 64
breakeven ....43

***C***

C4Finance developers ....2, 4, 89
Calculation Log ....6
call ....13, 32, 46
Cash Flow....3, 6, 26, 27, 28, 29, 56
category menu .... 12, 13, 18, 20, 51, 54, 59, 65, 73, 85
cbrt ....18
chg%n....51
chg%o....51
chg%p....51
chi2cdf....62
chi2pdf....61
clipboard controls ....14
comparing....64
copy ....4, 13, 16, 66, 69, 77, 87, 89
correlation coefficient....6, 58
cos ....17, 85
cosh ....86
cube root....18
curve-fitting model ....56
cut....13

***D***

damages....2
define guesses....77
depreciation ....36, 37, 38, 39
direct solution ....75, 76
dividend....6, 45
division ....18

***E***

editing....6, 8, 13
Ending Date ....65, 66, 72
Equation Editor....4, 59, 73, 74, 75, 79, 82
Equation Solver .... 4, 6, 13, 59, 73, 75, 77, 78, 80, 82
exp ....18
export....15

***F***

face value....32
factorial....19
FALSE....64
financial calculations ....89
formula ....45, 75, 82
fpart ....19
fractional....19
function pad ....13
Future Value ....20, 26, 49, 50

***G***

gamma ....19
gamma function ....19
Graffiti ....2, 7, 17
Graphics Explorer.... 4, 6, 59, 73, 74, 75, 77, 79, 84
guess ....29, 30, 75

***H***

hexadecimal....3, 11
hypot....11, 19

***I***

initial guess....75
Integer....19
interest period ....32
interest rate conversion....41
Internal Rate of Return ....26
invnormcdf ....60
ipart....19
IRR ....26, 28, 29, 30
iterative solution ....75

***L***

LFDY ....36
ln 18
log....3, 5, 16, 18
log2....18
logarithm ....18
logic....64

***M***

math....10, 13, 89
maturity date....33, 35
maximum....24, 54
mc%c....52
mc%m....52

mc%p....52
mean....54, 59, 60, 78
median....54
MemoPad....15
minimum....54
mod....19
mode....17, 54
mp%c....53
mp%m....52, 53
mp%p....53
multiple edit fields....6
multiplication....18

***N***

Net Future Value....26
Net Uniform Series....26
NFV....26, 29, 30
nominal annual interest rate....20
normcdf....60
normpdf....59
NPV....26, 29, 30, 43
NUS....26

***O***

octal....3, 6, 11
option....15, 46
order of calculations....66

***P***

Partial-Year Depreciation....39
percent key....3, 11
periodic interest rate....28, 49, 50
poissoncdf....63
poissonpdf....63
power....54
prediction....54, 56, 58
preferences....13
Present Value....20, 49
put....13, 66

***R***

range....23, 31, 54, 75, 77, 80
real calendar....65
recip....18
reciprocal....18
registration....88
regression models....6, 54
representation look....66
risk free....46
round....19

***S***

settlement date....33, 35
sin85
Single Payment Future Value....4, 49
Single Payment Present Value....4, 49
sinh....86
solution....30, 31, 75, 76, 77, 80, 81
solve....6, 31
spfv....49
sppv....49
sqrt....10, 18
square....10, 18
square root....10, 18
standard deviation....54, 59, 60
standard deviation of a discrete random variable....54
statistics....54
subtraction....18, 69
sum of squares....54

***T***

tan....85
tanh....86
tcdf....61
Time Value of Money....3, 6, 20, 21
total amount of the cash flows....26
total number of items....54
totl%p....51, 52
totl%pr....51
totl%t....52
tpdf....60, 61
trial and error method....30
TRUE....64
TVM....20, 22, 25

***U***

undo....5, 8
Uniform Series Future Value....4, 50
Uniform Series Present Value....4, 49
unit price....43
unlocking....4, 87, 89
usfv....50
uspv....49

***V***

volatility....46

***W***

warranty....2
weighted mean....54
worksheet name....21, 27, 55, 59

***X***

x! 19

***Y***

yield to maturity....33