BizAnalyst+

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Biz Analyst+

Biz Analyst+ is a general purpose business analysis program for accounting, real estate and business professionals as well as business students. It features over 100 built in functions for business, finance, mathematics, statistics, unit and currency conversions. Functions operate with a calculator interface or with worksheets designed to simplify calculations of specific business problems. Keys and worksheets are generously sized for easy data entry and computing on the touch screen.

All time value of money variables are continuously displayed to give you confidence in your problem setups. Results can be reviewed, annotated and forwarded to clients using the built in electronic audit tape and email and are easily moved between worksheets and the calculator.

The contents of the calculator and worksheets are preserved between computing sessions. If you are interrupted by a phone call or leave to work in another application, the next time you start Biz Analyst+ it will be restored to the state where you left off.

Screen Layout

A tool bar across the top of the display gives you access to the main functions of the calculator. Touch any of the icons in the tool bar to select from **Calculator**, **Worksheets**, Tape, Settings and Guide.

• **Calculator** Use the calculator for general purpose computations and for solving time value of money problems.

• **Worksheets** Solutions to a variety of every day business problems are encapsulated in set of worksheets. Touch the worksheet icon to display an index of the worksheets and then select a specific worksheet from the index. If a worksheet has already been selected and you want to view the index, touch the Worksheet icon a second time.

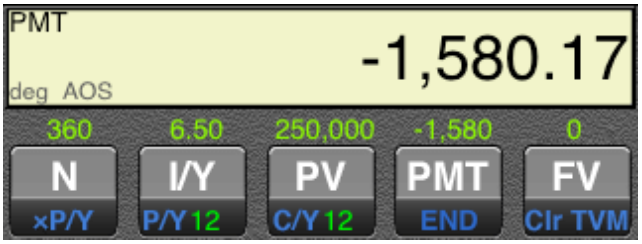
• **Tape** Review, annotate, cut/copy/paste and mail the results of computations with the tape tool.

•**Settings** Change the basic calculator settings from the settings screen.

• **Guide** Access and review the built in user manual. You can also send a tech support email directly from the "About Biz Analyst+" section of the guide.

Calculator

The primary function of each key is displayed in white. Many keys have a secondary function that is displayed in **blue** at the bottom of the key. To select a second function, touch the **2nd** key (the blue labels will hi light) followed by the corresponding key. For example, touching **2nd LN** computes the natural logarithm of the number in display.



Several keys feature a **green** status display. The status displays show the current values for computing time value of money problems.

Annunciators

The numeric display area contains a variety of annunciators that allow you to easily view the current computation modes in effect.

Angle

The angle annunciator indicates the angular mode in effect- degrees, radians or gradians.

Calculation Mode

The calculation mode annunciator indicates either chain for chain calculations or AOS for algebraic computation with operator precedence. Chain calculation mode performs operations as they are entered. AOS mode uses the algebraic hierarchy of operators to group operations. (See the settings guide topic for more information.)

INV

Indicates if the inverse shift is active for selecting an inverse trigonometric function.

HYP

Indicates if the hyperbolic shift is active for selecting a hyperbolic function.

Last Operation

The last operation annunciator displays the last operation that was performed. If you are unsure what key you pressed last, view the last operation annunciator.

Errors

Errors in operation are indicated either by a pop up alert message window or by a numeric display of **nan** or **inf**. For example, 2.÷0.= returns a result of **inf**. -2y^x.5= returns **nan**

Numeric Display

The numeric display line displays all pending operations and the final results. If more operations are pending than can be displayed, the display scrolls to the left, indicated by **...**

Decimal Places

The numeric display shows a number of decimal places from 0 to 13. The number of digits displayed to the right of the decimal is selected by touching **2nd DISP** followed by 0 - 8. To display

all available digits touch **2nd DISP** decimal point. To activate the floating decimal display, touch **2nd DISP** 9.

Entering Numbers

Touch keys to enter numbers and operations into the main display. A negative number is entered by first touching the number then the **+/-** key. Use the paren keys **( )** to group computations. All pending operations are displayed on the main line.

A number can also be entered in scientific mode by touching the number then **E** followed by an exponent. enter a negative exponent by touching **+/-** after touching **E**.

Examples:
enter -5.60 by touching the following sequence of keys:

5 . 6 +/- =

enter 5 billion (5 with 9 zeros) by touching the following sequence of keys:

5 E 9 =

Touch **=** to finalize a computation including any open parens.

Clearing Numbers

During number entry, the **C/CE** key works like a backspace key. It will erase 1 digit or operation at a time from the display until the display is empty.

If a number has just been computed, the **C/CE** key will clear the result to 0.

reset

The reset function will clear memory and return Biz Analyst+ to the factory settings as follows:

M0-M9		set to 0
N, I/Y, PV, PMT, FV	set to 0	
P/Y, C/Y		set to 1
Begin/End	set to END	

Time Value of Money Functions

The top row of keys are used for computing time value of money (TVM) problems. The TVM keys are dual operation keys:

• If you touch one of the TVM keys the number in the display line will be stored in the register associated with that key.

• If you touch the **CPT** key followed by one of the TVM keys, a value will be computed and displayed for that function.

The current setting of of **N**, **I/Y**, **PV**, **PMT** and **FV** is displayed in **green** immediately above each of the keys. The display above the keys is rounded to the nearest integer, except I/YR which is rounded to 2 decimal places. The full value is stored in the calculator and can be viewed by recalling it to the display using **RCL**. In addition, the current settings for **P/Y** and **C/Y** are displayed in **green** below the **I/Y** and **PV** keys.

N stores/computes the number of periods
I/Y stores/computes the interest rate per year
PV stores/computes the present value
PMT stores/computes the payment
FV stores/computes the future value
You must set 4 of the 5 variables and properly initialize the modifiers P/Y, C/Y and BEG/END before solving any tvm problem.

×P/Y Multiplies the value in the display times the **P/Y** setting and stores the result in **N**. For example if **P/Y** is 12, touch 30 **×P/Y** to store 360 in **N**. *(The cross symbol in front of P/Y is multiply, not the letter "X")*

P/Y stores the number of periods per year. Set it to 1 for annual payments, 12 for monthly payments. The current setting of **P/Y** is always displayed in **green** next to the **P/Y** label on the key. The **P/Y** key also sets the value of **C/Y** to be the same as **P/Y**.

C/Y stores the number of compounding periods per year. The current setting of **C/Y** is always displayed in **green** next to the **C/Y** label on the key.

BEG/END changes TVM computations to make pmt at beginning or end of the periods. Each time you touch the **BEG/END** key the label will change to the opposite value. For instance, if the **PMT** key **blue** label reads **BEG** and you touch **2nd** **PMT**, the label will change to **END** indicating END mode will

be used for computations.

prt tvm print the current time value of money values to the audit tape. *(Touch the Tape icon in the tool bar to review the tape.)*

Example:

Compute the monthly payments for a 20 year loan of 250,000 at 7.2% interest compounded monthly, payments made at the end of each month.

Touch the following keys:
2nd BEG/END if **END** is not displayed under the **PMT** key.
12 2nd P/Y (**C/Y** will also be set to **12**)
20 2nd ×P/Y (**N** will be set to **240**)
250000 PV
7.2 I/Y
0 FV
CPT PMT

The result is **-1,968.37**

Memory Keys

The memory keys are used to access the calculator storage locations. There are 10 general storage locations numbered 0 thru 9. In addition you can access the N, I/Y, PV, PMT, FV, P/Y, C/Y registers.

RCL recalls a number from storage. Touch **RCL** followed by a number **0** - **9** to access the general registers. Touch **RCL** followed by **N**, **I/Y**, **PV**, **PMT**, **FV, P/Y, C/Y** to recall a specialized register.

STO stores the currently displayed value to a memory location. Touch **STO** followed by a number **0** - **9** to store in the general registers. Touch **STO** followed by **N**, **I/Y**, **PV**, **PMT**, **FV, P/Y, C/Y** to store in a specialized register.

STO+
STO-
STOx
STO÷ perform register arithmetic by touching **STO** followed by **+ - x ÷** followed by a valid register number/name.

example:

Sum 5, 10, 15 into storage register 1 and recall the result.

touch the following keys:

5 STO 1 (store 5 in storage register 1)
10 STO + 1 (adds 10 to storage register 1)
15 STO + 1 (adds 15 to storage register 1)
RCL 1 (30 is displayed)

K stores a constant operation of + num, - num, × num, ÷ num, + num %, - num %, × num %, ÷ num %, y^x num

example:

Use the K function to automate adding 15% to the following numbers: 23.5, 16.5, 18

touch the following keys:

23.5 + 15% K = (sets K to +15%, result is 26.45)
16.5 = (result is 18.98)
18 = (result is 20.70)

Math Functions

√x square root of x for x ≥ 0
9 √x *returns* **3.00**

x^2 x squared
3 x^2 *returns* **9.00**

1/x reciprocal (x ≠ 0)
3 1/x *returns* **0.33**

% converts last entry to a percentage by dividing it by 100. If the last entry was + or -, % computes the percentage of the previous number on the display line.
3 % *returns* **0.03**
125.25 + 6.5% = *returns* **133.39**

y^x y raised to x (if y < 0 x must be integer ≥ 0)
3 y^x 2 = *returns* **9.00**

e^x natural antilog
3 2nd e^x *returns* **20.09**

LN natural logarithm for x > 0
20.09 2nd LN *returns* **3.00**

LOG logarithm base 10 for x > 0
2000 2nd LOG *returns* **3.30**

x! gamma function Γ(x+1) of non integer x
5 2nd x! *returns* **120.00**

rand returns a random number between 0 and 1

nPr returns the number of permutations
5 2nd nPr 3 = *returns* **60.00**

nCr returns the number of combinations
5 2nd nCr 3 = *returns* **10.00**

round rounds the number in the display to the number of decimal places shown in the display.

ANS returns the result of the last calculation.

Trig Functions

Angles are computed in degrees, radians or gradians depending on the setting of the Angle Units on the Settings page. The current angle setting is always displayed on the bottom left of the main display line. The examples given are in degrees.

sin sin(x)
45 2nd sin *returns* **0.71**

cos cos(x)
30 2nd cos *returns* **0.87**

tan tan(x)
25 2nd tan *returns* **0.47**

The inverse trigonometric functions are computed by first touching the **INV** key followed by the function. *(You do not need to touch* **2nd** *before touching the trig function key.)*

INV sin arc sin(x) for |x| ≤ 1
INV sin .5 *returns* **30.00**

INV cos arc cos(x) for |x| ≤ 1
INV cos .75 *returns* **41.41**

INV tan arc tan(x)
INV tan .8 *returns* **38.66**

The hyperbolic functions are computed by first touching **2nd HYP** followed by the function. *(You do not need to touch the* **2nd** *key before touching the function)*

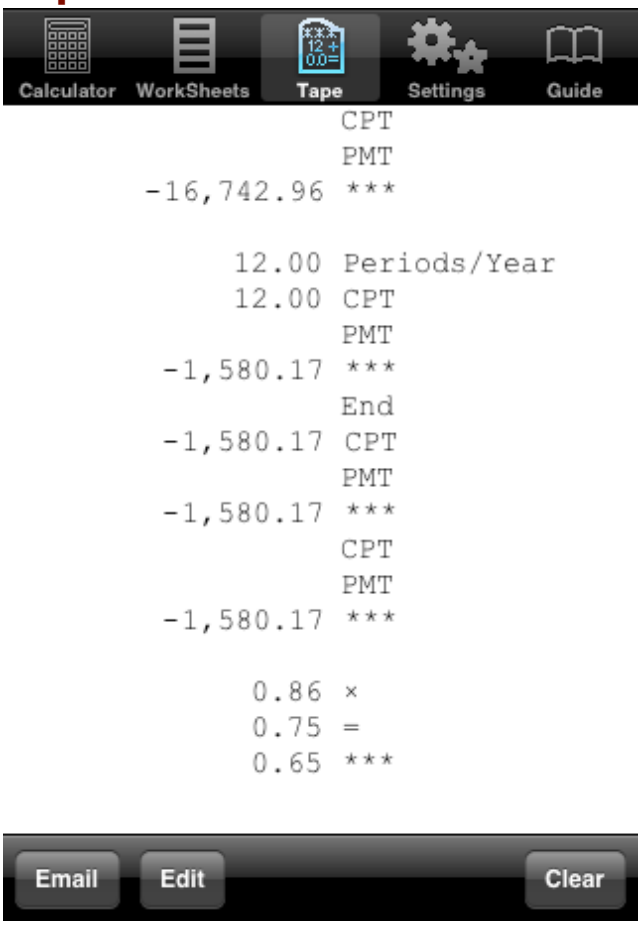
2nd HYP sin hyperbolic sin
10 2nd HYP sin *returns* **11,013.23**

2nd HYP cos hyperbolic cos
1.5 2nd HYP cos *returns* **2.35**

2nd HYP tan hyperbolic tan
5 2nd HYP tan *returns* **1.00**

The inverse hyperbolic functions are computed by touching **INV 2nd HYP** followed by the function. *(You do not need to touch the* **2nd** *key before touching the function)*

Tape



The print tape keeps a running audit of the last 400+ keyboard operations. Operations beyond the last 400 are dropped off the top of the tape. The print tape can be scrolled up and down by swiping with your finger. Touch the **Edit** button to display the keyboard for edits. You can insert annotations by typing on the keyboard. The standard iPhone 3.0 cut/copy/paste operations are also supported.

Control buttons

Edit

Touch the edit button to enable editing and show the keyboard.

Hide Keyboard

Touch the Tape icon in the tool bar to hide the keyboard.

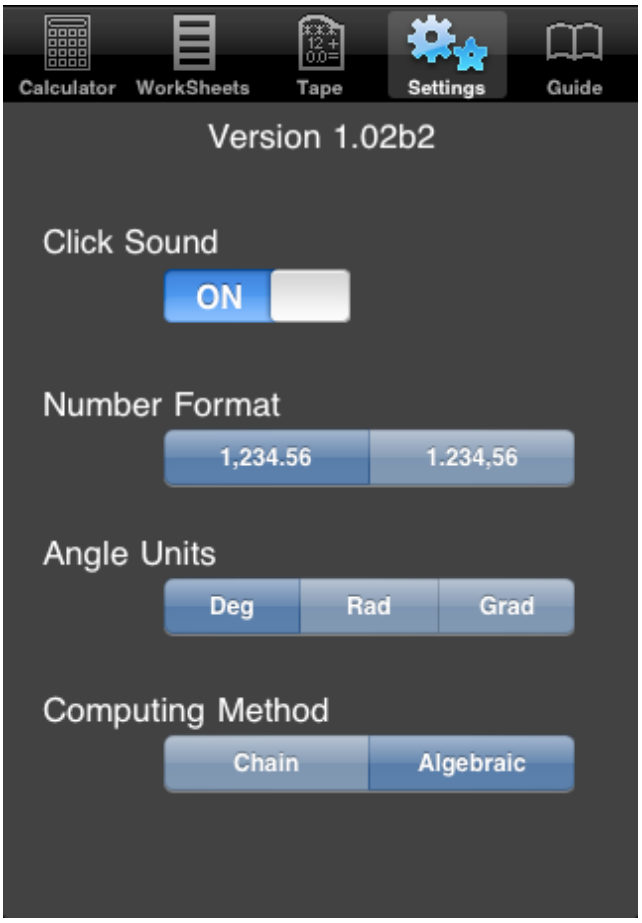
Email

Touch the email button to email the print tape. Fill in the To field and then touch Send.

Clear

Touch the clear button to erase the print tape.

Settings



Touch the Settings tool to display the settings screen. Settings control basic behavior of the calculator.

Click Sound

turn on/off keyboard click sound

Number Format

select between comma or period for the separator between each 3 digits of mantissa and decimal radix character.

Angle Units

specify the units for doing trigonometric computations by touching one of the following:

Deg angles measured degrees. 360 degrees = 1 revolution
Rad angles measured in radians 2 Pi radians = 1 revolution
Grad angles measured in gradians. 400 grads = 1 revolution

Computing Method

select from doing calculations using either chain or full algebraic precedence.

Chain

All operations have equal precedence, the calculator solves problems in the order that you enter them.

example:

Compute 20 × 3.5 + 5 × 4.2 using chain method.

touch the following keys on the calculator:

keys	*display line contents*
20	20
×	20.00×
3.5	20.00×3.5
+	70.00+
5	70.00+5.00
×	75.00×
4.2	75.00×4.2
=	315.00

Algebraic

Operations are executed according to an algebraic hierarchy. For instance, multiplication and divisions are performed before addition and subtraction in mixed calculations.

example:

Compute 20 × 3.5 + 5 × 4.2 using algebraic method.

touch the following keys on the calculator:

keys	*display line contents*
20	20
×	20.00×
3.5	20.00×3.5
+	70.00+
5	70.00+5.00
×	70.00+5.00×
4.2	70.00+5.00×4.2
=	91.00

Worksheets

Touch the Worksheets icon in the tool bar to display the index of worksheets. Touch an entry on the index page to open a worksheet. Return to the index page by touching the Worksheets icon in the tool bar.

You can transfer to another tool while a worksheet is open by touching it's icon in the tool bar. When you return to the Worksheets, the last worksheet you had open will be displayed. If you want to display the index, touch the Worksheet icon a second time.

Worksheet Layout

Worksheets have numeric entry fields, result fields, multi button selectors and computation buttons.

Numeric Entry Fields

Numeric entry fields are drawn as a box with a white background. The value of the field is drawn inside the box. To change the value in a numeric entry field, touch the field. The background will change to yellow to indicate that it is selected. If the calculator keypad is not already displayed, it will slide up. Touch

keys on the keypad to edit the value. A new value is stored in the field when you touch the = key or when you move to another field.

When an entry field is selected, it's value is also placed into the calculator display. *(Touch the calculator icon in the tool bar to view the result.)*

Result Fields

Result fields display the result of a calculation and are drawn in a light green color. They are not editable, but if you touch a result field, it's value will be placed into the calculator display. *(Touch the calculator icon in the tool bar to view the result.)*

Multi Button Selectors

Multi button selectors allow you to choose between modes of calculation. Touch a segment of the selector to activate the mode displayed on the segment label.

Computation Button

A computation button is a round blue button with a > in the center. Touch a computation button to compute the value of the field it is next to.

Numeric Entry Keypad

The numeric entry keypad appears when you touch any numeric entry field. You can hide the numeric keypad by touching **2nd done** (touch the 2nd key twice).

Use the keypad to enter values into the selected numeric entry field. Computations can be carried out in any entry field by touching a sequence of numbers and functions on the keypad just as you would on the calculator. Finalize the value in a field by touching the **=** key, touching the **next** or **prev** key or by touching another field.

Keys

0-9. +/-

Use the number keys to enter a value.

Enter a negative value by first entering the number then touch the +/- key.

÷x-+

Touch these keys to perform arithmetic within a field.

=

Touch the equal key to finalize a computation.

←

Touch the backspace key to delete digits one at a time until the field is empty. If a value has been finalized, the backspace key will clear it to 0.

clr wrk

clear the worksheet variables to their default values.

2nd

Touch the second key to access the functions listed at the bottom of the keys.

next

Touch the **next** key to select the next field in the worksheet.

prev

Touch the **prev** key to select the previous field in the worksheet.

STO

touch **STO** followed by a digit **0** - **9** to store the value in the field in one of the general storage registers.

RCL

touch **RCL** followed by a digit **0** - **9** to place the value stored in one of the general storage registers in the selected field.

disp

touch **disp** followed by a digit **0** - **9** or **.** to change the number of decimal places displayed.

delete

touch the **delete** key to delete a row from a scrolling list of values. For instance, you can delete a row from the cash flow list or from the statistics list by selecting the row and then touching the delete function.

insert

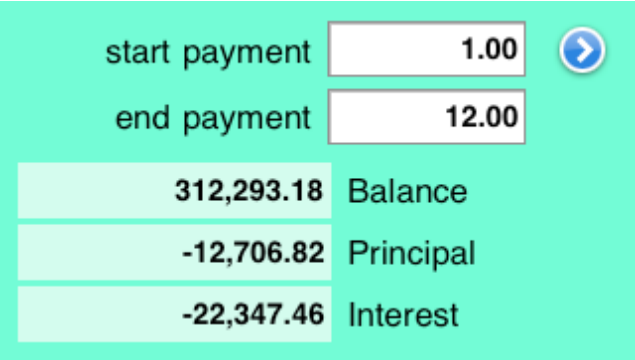
touch the **insert** key to insert a row in a scrolling list of values.

ANS

touch the **ANS** key to copy the last answer into the current field.

Refer to the calculator description page for information about the remaining key functions.

Amort



The Amort worksheet is used to compute an amortization schedule. First solve your TVM problem using the calculator. Then select the Amort worksheet. The Amort worksheet uses the TVM values to generate the amortization schedule.

Entry Fields

start payment
the starting payment of the amortization
end payment
the ending payment of the amortization

Result Fields

Balance
The remaining balance after making the end payment.
Principal
The principal paid during the amortization period.
Interest
The interest paid during the amortization period

Compute Button

start payment button
Touch the start period button to advance the start and end period fields to the next amortization period. ie. add (end payment#) - (start payment#) to start period and to end period.
The start payment button also prints the results of the amortization to the audit tape.

Example

Compute an annual amortization schedule for the first 2 years of a 15 year mortgage for 325,000 at 7% interest with monthly payments.

Touch the Calculator tool and key in the TVM values. Make sure END mode is selected on the PMT then touch:

12 2nd P/Y
15 2nd ×P/Y
7 I/Y
325,000 PV
0 FV
CPT PMT

for a payment of -2,921.19

Then touch the Worksheets tool and select the Amort worksheet. Touch the **start payment** field. Then on the keypad touch:

1 next
12

Then touch the **start payment** compute button to compute the 1st year (months 1-12)

Balance = 312,293.18
Principal = -12,706.82
Interest = -22,347.46

To view the 2nd year, touch the **start payment** compute button again. The start payment will advance to 13 and the end payment will advance to 24

Balance = 298,667.79
Principal = -13,625.39
Interest = -21,428.89

You can review the results by touching the Tape tool.

Note:
The payment value is rounded to the number of displayed digits. All computations are carried out with the rounded value of the payment.

Black-Scholes

This worksheet implements the Black-Scholes European option pricing model.

C = SN(d1) - Ke^(-rt)N(d2)

d1= (ln(S/K) + (r + (s^2)/2)^t)/(s * t^.5)

d2 = d1 - s * t^.5

where:

C = theoretical call premium
S = current stock price
t = time until option expiration
K = option striking price
r = risk-free interest rate
N = cumulative standard normal distribution
s = standard deviation of stock returns

Refer to numerous articles on the web for further explanation.
http://en.wikipedia.org/wiki/Black–Scholes

Entry Fields

Stock Price
the current stock price

Strike Price
the option striking price

Yrs to Mature
the time until option expiration

Risk Free%
risk-free interest rate

Volatility%
the standard deviation of the stock

Result Fields

The call and put fields return the pricing for a European call option:

call
the call option worth at maturity

put

the put option worth

The following "Greeks" can be used as a measure of the sensitivity of the model to variation in the inputs.

Delta
the partial derivative with respect to the price of the stock

Theta
the partial derivative with respect to time / 365

Rho
the partial derivative with respect to the interest rate / 100

Vega
the partial derivative with respect to volatility / 100

Gamma
the 2nd derivative of the option price with respect to the price of the stock

Note: the model is computed using IEEE doubles. In particular the computation of N is accurate to over 15 digits. Many of the models available online at various web sites are not as rigorous...YMMV

example:
A stock is currently selling for 100.00 and the option strike price is 95.00. The option is due in 90 days. The current risk free interest rate is 5% and the stock's standard deviation is 25%. What is the European call and put valuation using the Black-Scholes pricing model?

touch the Worksheets tool and select the Black-Scholes worksheet.

touch the Stock Price field and use the popup keypad to enter:

100 next	*(Stock Price = 100)*
95 next	*(Strike Price = 95)*
90 / 365 next	*(Yrs to Mature = 0.247)*
5 next	*(Risk Free % = 5)*
25 =	*(Volatility = 25)*

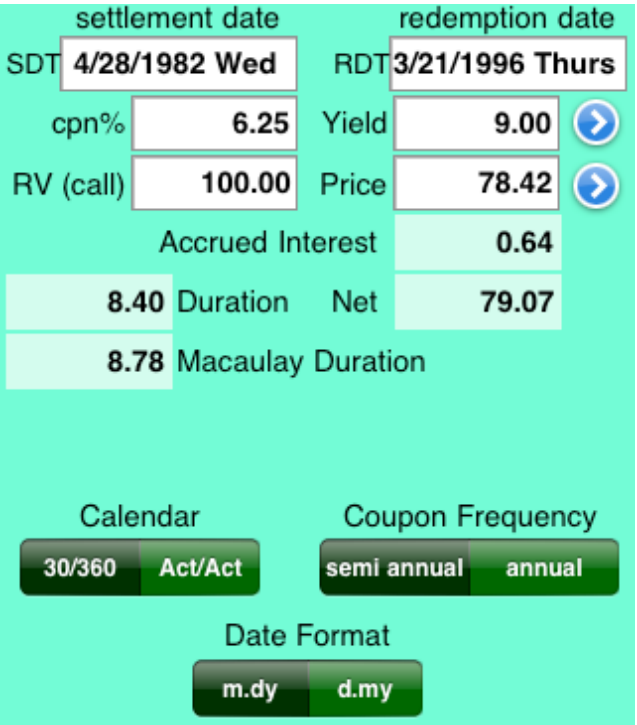
touch 2nd done to hide the keypad to view the Greeks. Touch the print button to generate a print output to the the audit tape.

```
******** Black-Scholes *********
          100.00 Stock Price
           95.00 Strike Price
            0.25 Yrs to Mature
            5.00 Risk Free%
            25.00 Volitility%

             8.49 call
             2.33 put
```

```
 0.72 call Δ
-0.03 call Θ
 0.16 call P
-0.28 put Δ
-0.02 put Θ
-0.08 put P
 0.17 Vega
 0.03 Γ
```

Bond



Compute bond price, yield to maturity or call and
accrued interest using the Bond worksheet.

Selectors

calendar

30/360 compute days between dates using a calendar based on 30 day months, with 360 days in the year

Act/Act compute days between dates using the actual number of days in the months and years

Coupon Frequency

semi annual specifies 2 coupons per year

annual specifies 1 coupon per year

Date Format

m.dy Date entries are specified using mm.ddyyyy and are displayed mm/dd/yyyy

d.my Date entries are specified using dd.mmyyyy and are displayed dd/mm/yyyy

where mm = month, dd = day of the month, yyyy = year
For example if m.dy format is selected, you would enter the date of July 19, 2009 as 7.192009 and it will be displayed as 7/19/2009 Sun

Entry Fields

settlement date
the settlement (purchase) date

redemption date
the maturity date or call date. the call date must coincide with a coupon date.

cpn%
the annual coupon rate as a percentage

Call
the call or redemption value. For *to maturity* analysis, enter 100 for call. For *to call* analysis, enter the call price.

Yield
the yield (as an annual percentage) to maturity or yield to call date.

Price
the price per $100 face value

Compute Buttons

Yield
computes the yield given the price

Price
computes the price given the yield

Result Fields

Accrued Interest

the interest accrued from the last coupon payment date until the settlement date, per $100 face value.

Net

Price + Accrued Interest

Macaulay Duration

A measurement of how long, in years, it takes for the price of a bond to be repaid by its internal cash flows. Uses classic Macaulay formula.

Duration

Modified version of the Macaulay model that accounts for changing interest rates. This shows how much the duration changes for each percentage change in yield.

example:

What price should you pay on November 28, 2009 for a 6 3/4% U.S. Treasury bond that matures on June 1, 2018 if you wish a yield of 8 3/8%? Assume actual calendar basis and semi-annual coupon payments.

touch the Worksheets tool and select the Bond worksheet.

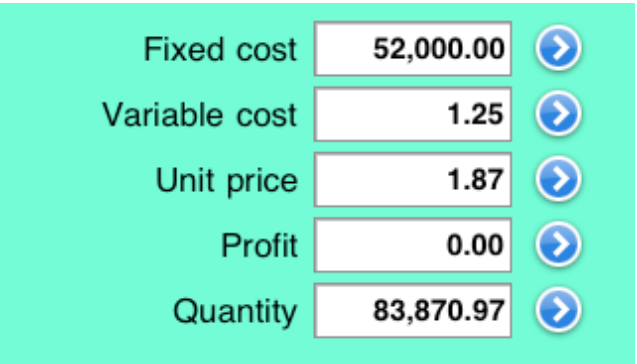
touch **Act/Act** in the **Calendar** selector
touch **semi annual** in the **Coupon Frequency** selector
touch **m.dy** in the **Date Format** selector
touch the **settlement date** field
on the keypad touch the following keys:

`11.282009 next`	*(settlement date = 11/28/2009 Sat)*
`6.012018 next`	*(maturity date = 6/1/2018 Fri)*
`6.75 next`	*(cpn% = 6.75)*
`100 next`	*(call = 100)*
`3 ÷ 8 + 8 =`	*(Yield = 8.38)*

finally touch the **Price** compute button to compute:

Price = 90.25
Accrued Interest = 3.32
Net = 93.57
Duration = 6.01
Macaulay Duration = 6.26 years

Breakeven



The Breakeven worksheet allows you to make
business decisions in a typical manufacturing situation. Input and review the relationship between fixed costs, variable costs, unit/selling price, profit and quantity. Enter any
4 of the variables and solve for the 5th.

Entry Fields

Fixed cost

the total cost of any machinery or infrastructure required for producing goods. This cost is incurred regardless of quantity produced.

Variable cost

the costs incurred for each unit produced independent of the fixed costs. This includes raw materials cost, labor, energy costs or any other cost that is incurred on a per item basis.

Unit price

the selling price per item

Profit

the amount of profit resulting from producing a quantity of items.

Quantity

the total number of items produced.

Compute Buttons

touch the compute button next to any of the fields to compute the value of that field based on the input values of the other 4 fields.

example:

Your new led light bulb design has just received UL approval. The equipment to set up a manufacturing line capable of producing 10,000

bulbs a day will cost 1.5 million. Materials, labor and energy costs will run 1.50 per bulb. To compete with existing bulbs, you can charge no more than 3.50 per bulb. How many bulbs must you produce to break even?

Touch the Worksheets icon in the tool bar and then select the Breakeven worksheet.

touch the **Fixed cost** input field and then enter the following keystrokes on the keypad:

1500000 next	(fixed cost = 1,500,000.00)
1.5 next	(variable cost = 1.50)
3.5 next	(unit cost = 3.5)
0	(profit = 0)

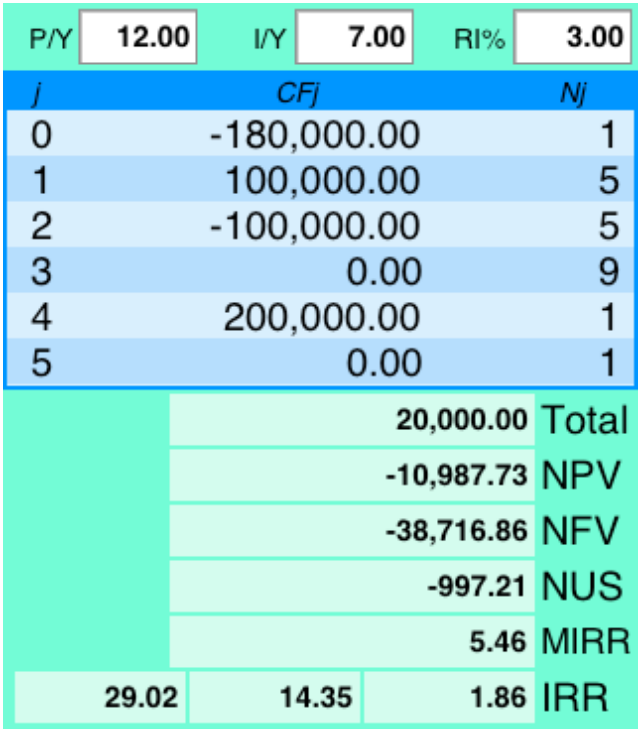
then touch the **Quantity** compute button. If you sell 750,000 bulbs, you will recoup your fixed and variable costs and achieve 0 profit.

example:

If you want to earn a profit of 500,000.00 how many bulbs must you sell?

Using the setup from the first example, touch the **Profit** field, then enter 500000 using the keypad. touch the **Quantity** compute button to compute the quantity required.
You will have to sell 1,000,000 bulbs to achieve a profit of 500,000.00.

Cash Flow



Use the Cash Flow worksheet to analyze uneven cash flows. Work with up to 80 cash flows in a scrolling list to compute total, NPV, NFV, NUS, IRR and MIRR.

Entry Fields

P/Y
specify the number of periods per year.

I/Y
the annual interest rate for computing NPV, NFV, NUS

RI%
the reinvestment rate for computing MIRR

Cash Flow List
enter cash flows into the cash flow list. Touch the list and move your finger up/down to scroll. Touch an entry to hi light it for editing. To edit successive cash flows, use the **next** key or the **=** key to move between flows. The column labeled *CFj* stores the cash flow amount. If the cash flow is repeated a consecutive number of times, enter the repeat count in the column labeled *Nj*.

Rows can be inserted or deleted:

•To delete the selected row, touch **2nd delete** on the keypad.
•To insert a new row before the currently selected row,

touch **2nd insert** on the keypad.

Result Fields

The result fields are automatically computed as the entry fields are modified. If the keypad is covering the result fields, touch **2nd done** to hide the keypad.

Total
: the total of the cash flows

NPV
: net present value of the cash flows using I/Y

NFV
: net future value (future value of the net present value)

NUS
: net uniform series (the amount of constant, equal cash flows having a present value equivalent to the net present value).

IRR
: internal rate of return

Note: Certain cash flows can generate more than 1 solution for the internal rate of return calculation. The IRR field will show all the values found.

MIRR
: modified internal rate of return

MIRR computes a modified internal rate of return based on the following: MIRR = 100 ((PositiveNFV / -NegativeNPV)^1/n - 1) where:

PositiveNFV = future value of positive cash flows using the I/Y rate.

NegativeNPV = net present value of negative cash flows using the RI% rate.

example:

You purchase an apartment for 450,000. The first year after improvements, you net 5,000. Over the next couple years you decrease the vacancy rate and increase the rents. Year 2 you net 6,000, and in year 3 you net 7,000. The following 8 years you net 10,000. In year 12 you sell the apartment for 500,000. How did your investment perform? Assume an interest rate of 8% and a reinvestment rate of 5%.

Touch the Worksheets icon on the tool bar and then select the Cash Flow worksheet. Touch the **Clear** button in the lower left corner of the screen. Touch the **P/Y** field and then enter the following keystrokes on the keypad:

1 next *(P/Y = 1)*
8 next *(I/Y = 8)*
5 next *(RI%=5)*

touch the cash flow list to select *CFj* in the first row. Then use the keypad to enter:

450000+/- next next *(CF0 = -450,000)*
5000 next next *(CF1 = 5,000)*
6000 next next *(CF2 = 6,000)*
7000 next next *(CF3 = 7,000)*
10000 next *(CF4=10,000)*
8 next *(Nj4=8)*
500000 next *(CF5=500,000)*
2nd done *(hide the keyboard)*

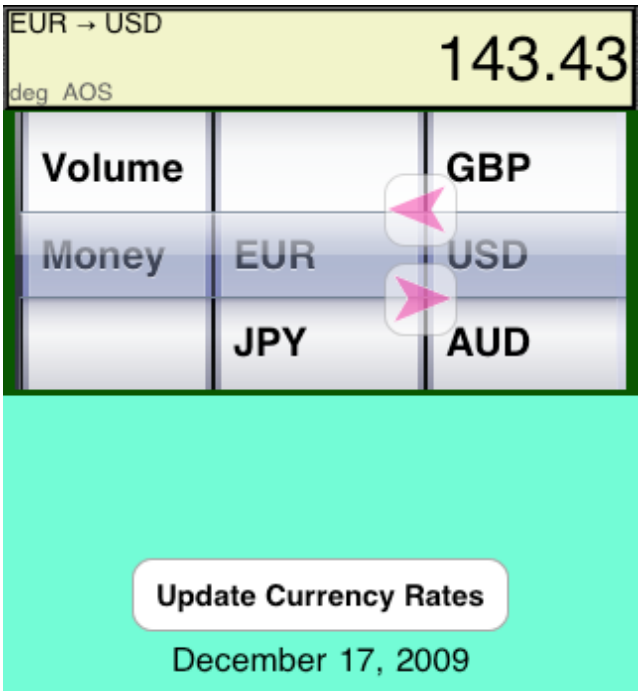
You can view the results on the screen or touch the **Print** button to print the results to the Tape. Touch the Tape icon in the tool bar at the top of the screen to get the following report:

```
********** Cash Flow ***********
           1.00 P/Y
           8.00 I/Y
           5.00 RI%

 j             CFj   Nj
 0      -450,000.00  1
 1         5,000.00  1
 2         6,000.00  1
 3         7,000.00  1
 4        10,000.00  8
 5       500,000.00  1

      148,000.00 Total
     -190,493.96 NPV
     -479,696.20 NFV
      -25,277.60 NUS
            2.61 IRR
            3.16 MIRR
```

Convert



Over 100 commonly used conversion factors are stored in the calculator and are accessed using the scroll wheels of the conversion worksheet.

Scroll the left most scroll wheel to select the type of conversion. Then scroll the middle and right scroll wheels to select the units to convert between. If the keypad is not visible, touch the display line to scroll up the keypad. Enter the quantity to be converted in the display and then touch either the left or right pink button to compute the conversion in the direction indicated by the touched button.

The conversion is applied and the lastOp annunciator shows the units and direction of conversion.

example:

A small residential lot is listed as being 0.125 acres. How many square feet is it?

Touch the Worksheets icon in the toolbar. Then select the Convert worksheet.
Slide the leftmost wheel so that **Area** is under the selector indicator (gray area in the vertical center of the wheel).
Slide the center wheel so that **Acre** is under the selector.
Slide the rightmost wheel so that **ft²** is under the selector.
Touch the display line to bring up the keypad and enter .125
Touch the lower pink arrow button to convert from **Acre** to **ft²** *(the pink arrow points to the right indicating a conversion from the center column to the right column units).*

The result of 5,445.00 is shown, the upper left corner of the display shows **Acre→ft²** to indicate Acres were converted to ft²**.**

example:

> Another lot is listed as having 8,200 square feet. How many acres is this?

Leave the selection wheels in the same position as the above example. On the keypad enter 8200 and then touch the upper pink arrow button to convert from ft² to acres. *(The upper pink button points to the left to indicate a conversion from the right column to the center column units).*

The result is 0.19. The upper left corner of the display shows **ft²→Acre** to indicate ft² were converted to acres. To see more precision in the result, touch
`2nd disp 4`
to redisplay the result as 0.1882

Money / Currency Conversions

The Money conversions use rates loaded from the International Monetary Fund web site:

http://www.imf.org/external/np/fin/data/rms_rep.aspx

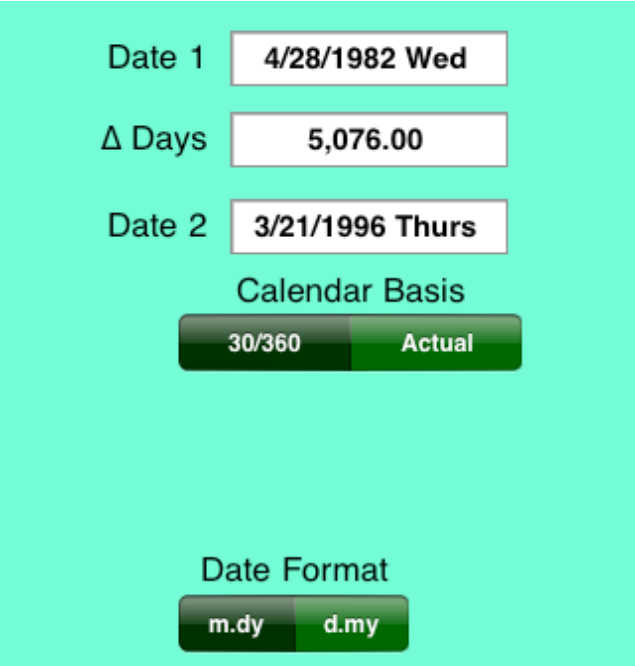
To update the rates, touch the **Update Currency Rates** button. If the keypad is visible, touch **2nd done** to hide the keypad and expose the update button. You must have an active internet connection for the rates to download. The date of the last download is displayed below the button. The downloaded rates are retained in the calculator until the next time the download button is touched so they can be used when you are not connected to the internet. The IMF site does not update all rates every day. The download function stores the most recently reported rate for each currency.

The currency codes displayed are those defined by ISO 4217

```
EUR  Euro
JPY  Japanese Yen
GBP  U.K. Pound Sterling
USD  U.S. Dollar
AUD  Australian Dollar
BHD  Bahrain Dinar
BWP  Botswana Pula
BRL  Brazilian Real
BND  Brunei Dollar
CAD  Canadian Dollar
CLP  Chilean Peso
```

CNY	Chinese Yuan
COP	Colombian Peso
CYP	Cyprus Pound
CZK	Czech Koruna
DKK	Danish Krone
HUF	Hungarian Forint
ISK	Icelandic Krona
INR	Indian Rupee
IDR	Indonesian Rupiah
IRR	Iranian Rial
ILS	Israeli New Sheqel
KZT	Kazakhstani Tenge
KRW	Korean Won
KWD	Kuwaiti Dinar
MYR	Malaysian Ringgit
MTL	Maltese Lira
MUR	Mauritian Rupee
MXN	Mexican Peso
NPR	Nepalese Rupee
NZD	New Zealand Dollar
NOK	Norwegian Krone
OMR	Rial Omani
PKR	Pakistani Rupee
PLN	Polish Zloty
QAR	Qatar Riyal
RUB	Russian Ruble
SAR	Saudi Arabian Riyal
SGD	Singapore Dollar
ZAR	South African Rand
LKR	Sri Lanka Rupee
SEK	Swedish Krona
CHF	Swiss Franc
THB	Thai Baht
TTD	Trinidad And Tobago Dollar
AED	U.A.E. Dirham
VEB	Bolivar Fuerte

Date



The date spreadsheet computes the number of days between two dates, the day of the week for a date or the date some number of days before or after a starting date.

Selectors

calendar

30/360 compute days between dates using a calendar based on 30 day months, with 360 days in the year

Act/Act compute days between dates using the actual number of days in the months and years

Date Format

m.dy Date entries are specified using mm.ddyyyy and are displayed mm/dd/yyyy

d.my Date entries are specified using dd.mmyyyy and are displayed dd/mm/yyyy

where mm = month, dd = day of the month, yyyy = year
For example if m.dy format is selected, you would enter the date of July 19, 2009 as 7.192009 and it will be displayed as 7/19/2009 Sun

Entry Fields

Date1
the starting date

Δ Days
the number of days between **Date 1** and **Date 2**. If **Date 2** is before **Date 1** a negative value is computed. If you enter a value in **Δ Days** using the keypad, **Date 2** is recomputed to be Δ Days from **Date 1**

Date2
the ending date. If you enter a value into **Date2** the **Δ Days** value is recomputed.

example:
How many days are between Nov. 29, 2009 and Aug. 1, 2010? Assume actual days in m.dy format.

Touch the Worksheet icon in the tool bar, then select the date worksheet. If the keypad is visible, touch 2nd done to hide it.

touch Date Format m.dy selector
touch Calendar Basis Act/Act selector
touch Date 1 and then enter the following keystrokes on the keypad:

`11.292009 next`	*(Date 1 = 11/29/2009 Sun)*
`next`	*(skip over Δ Days)*
`8.012010 =`	*(Date 2 = 8/1/2010 Sun)*

There are 245 days between the given dates.

example:
How many days are between the dates just entered using 30 day months, 360 day years?

touch Calendar Basis 30/360 selector to compute 242 days

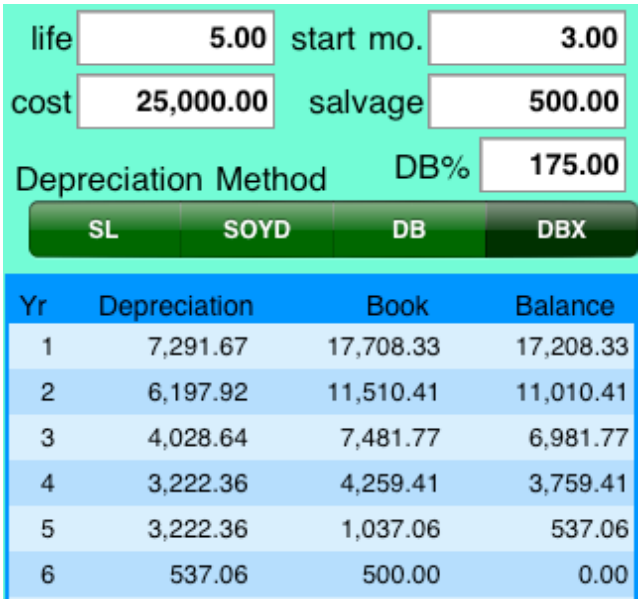
example:
What is the date and day of the week that is 1,000 days after Sept. 15, 2009? Assume 30/360 calendar, m.dy format.

touch Date1 field and enter the following keystrokes:

`9.152009 next`	*(Date 1 = 9/15/2009 Tue)*
`1000 =`	*(Δ Days = 1,000.00)*

Date 2 is updated to show 6/11/2012 Mon

Depreciation



Yr	Depreciation	Book	Balance
1	7,291.67	17,708.33	17,208.33
2	6,197.92	11,510.41	11,010.41
3	4,028.64	7,481.77	6,981.77
4	3,222.36	4,259.41	3,759.41
5	3,222.36	1,037.06	537.06
6	537.06	500.00	0.00

Use the Depreciation worksheet to compute a depreciation
schedule using a variety of accounting methods.

Selector

Depreciation Method
choose a depreciation method for the worksheet

SL
straight line depreciation method.

SOYD
sum of years depreciation

DB
declining balance depreciation

DBX
declining balance with cross over to SL. The cross over point occurs in the year when the DB computation becomes less than the SL for that year. From that year to the end of the useful life, SL is used.

Entry Fields

life
the useful life of the asset

starting month
the month to start the depreciation calculation. If only full years are needed, set to 1. If the asset is purchased in the middle of the year, enter the month the asset was purchased. If the asset was purchased in the middle of the month, you can enter a fraction- ie. if the asset is placed into service April 15, enter 4.5

asset cost
the depreciable value of the asset

salvage value
the asset value at the end of the depreciation life

DB%
the factor to be applied for DB and DBX calculations. The default value is 200%.

Result Fields

depreciation table
each row of the depreciation table displays the year, depreciation for the year, remaining book value and the balance of the remaining depreciation.

example:
A logic analyzer is purchased for 9,500 with 6 months left in the current fiscal year. The analyzer's useful life is 8 years and the salvage value is 100. Using a 200% declining-balance factor, generate a depreciation schedule for the life of the analyzer.

Touch the Worksheet icon in the tool bar and then select the Depreciation worksheet.

If the keypad is displayed, touch **2nd done** to hide the keypad. Touch the **DB** segment of the **Depreciation Method** selector. Touch the **life** field and on the keypad enter the following:

8 next	*(life = 8)*
6 next	*(starting month = 6)*
9500 next	*(asset cost = 9,500.00)*
500 next	*(salvage value = 500.00)*
100 next	*(DB% = 100)*
2nd done	*(hide the keypad)*

The results for are:

```
YR       Depr.      Book    Balance
```

1	1,385.42	8,114.58	8,014.58
2	2,028.65	6,085.93	5,985.93
3	1,521.48	4,564.45	4,464.45
4	1,141.11	3,423.34	3,323.34
5	855.84	2,567.50	2,467.50
6	641.88	1,925.62	1,825.62
7	481.41	1,444.21	1,344.21
8	361.05	1,083.16	983.16
9	983.16	100.00	0.00

example:

What would the depreciation schedule be if the declining balance with cross over is used?

Leave the setup from the above example. Touch the **DBX** segment of the **Depreciation Method** selector and the schedule will be updated.

The results for DBX depreciation are:

YR	Depr.	Book	Balance
1	1,385.42	8,114.58	8,014.58
2	2,028.65	6,085.93	5,985.93
3	1,521.48	4,564.45	4,464.45
4	1,141.11	3,423.34	3,323.34
5	855.84	2,567.50	2,467.50
6	722.20	1,845.30	1,745.30
7	722.20	1,123.11	1,023.11
8	722.20	400.91	300.91
9	300.92	100.00	0.00

Interest Conversion

Use the interest conversion spread sheet to convert interest
rates between nominal rate (annual percentage rate) and
annual effective rate.

Entry Fields

Nominal Rate%
The nominal interest percent

Effective Rate%
The effective interest percent

C/Y
The number of compounding periods per year

Compute Buttons

Nominal Rate%
computes the nominal rate given an effective rate and C/Y

Effective Rate%
computes the effective rate given a nominal rate and C/Y

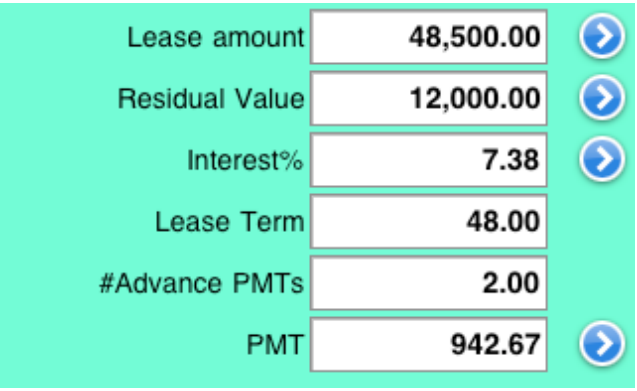
example:
Find the annual effective interest rate of 8.5% nominal interest compounded monthly.

touch the Worksheets tool and select the Interest Conversion worksheet.
touch the Effective Rate% edit field to bring up the keypad.
on the keypad touch the following keys:

`8.5 next` *(effective percentage = 8.5)*
`12 =` *(C/Y = 12)*

then touch the **Nominal Rate%** compute button to get a result of 8.19

Lease



Compute a lease with advance payments. Solve for payment, lease amount, residual value or yield (interest).

Entry Fields

Lease amount
the loan amount

Residual Value
the value remaining at the end of the lease

Interest%
the annual interest rate

Lease Term
the number of months the lease runs

#Advance PMTs
the number of advance payments

PMT
the payment amount

Compute Buttons

Lease amount
solves for the lease amount

Residual Value
solves for the residual value

Interest%
solves for the lease yield (interest rate)

PMT
solves for the payment amount

example: SOLVE FOR PAYMENT

A new Lexus valued $45,000 is to be leased for 48 months. The lessee has agreed to make 4 payments in advance with a purchase option at the end of the lease enabling her to buy the car for 40% of the purchase price. If the interest rate is 12.5%, what are the monthly payments?

touch the Worksheets tool and select the Lease worksheet. Touch the Lease amount field and then enter the following using the keypad:

45000 next *(Lease amount = 45,000)*
45000 × 40% next *(Residual Value = 18,000)*
12.5 next *(Interest% = 12.5)*
48 next *(Lease Term = 48)*
4 *(#Advance PMTs = 4)*

Finally touch the compute button to the right of the PMT field to compute a payment of $869.80

example: SOLVE FOR YIELD

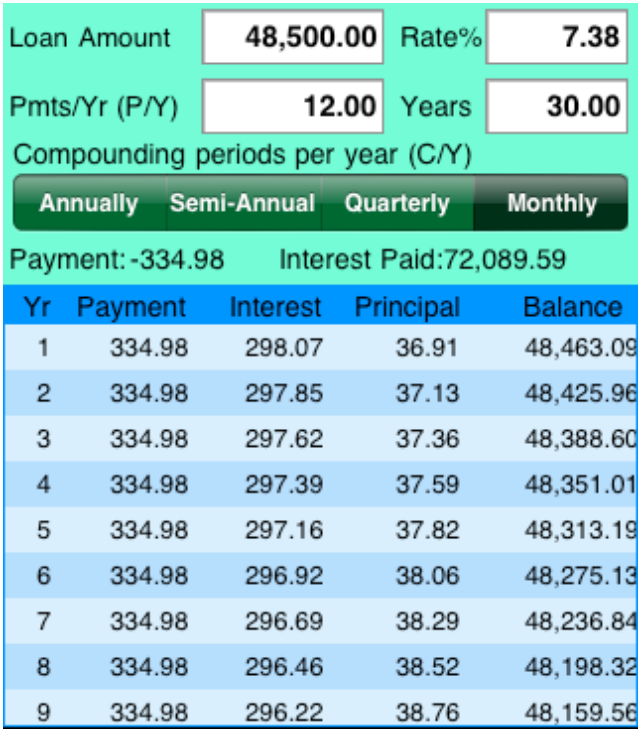
Equipment worth $7,500 is leased for 36 months at $180 per month. The lessee has agreed to pay the first and last month's payments in advance. At the end of the lease, the equipment may be purchased for $1,800. What is the annual yield to the lessor if the equipment is purchased?

Touch the Lease amount field and then enter the following using the keypad:

7500 next *(Lease amount = 7,500)*
1800 next *(Residual Value = 1,800)*
next *(skip over Interest%)*
36 next *(Lease Term = 36)*
2 next *(#Advance PMTs = 2)*
180 *(PMT = 180)*

Finally touch the compute button to the right of the Interest% field to compute a yield of 5.83%

Loan Amortization



Enter and view a loan amortization. The loan payments,
interest paid and amortization table are automatically
computed after entering the loan amount, rate%, P/Y,
Years and C/Y.

Selector

Compounding periods per year (C/Y)
Select the number of compounding periods per year.

Annually sets C/Y = 1
Semi-Annual sets C/Y = 2
Quarterly sets C/Y = 4
Monthly sets C/Y = 12

Entry Fields

Loan Amount
the total amount loaned

Rate%
the annual percentage rate

Pmts/Yr (P/Y)
the number of payments per year

Years
the number of years in the loan

Result Fields

Payment:
the recurring payment amount

Interest Paid:
the total interest paid over the life of the loan

Amortization Table
display of all payments showing the interest and principal component of each payment and the remaining balance on the loan.

example:
Compute a 20 year loan for 250,000 at 8.5% annual interest with 12 payments per year and monthly compounding.

Touch the Worksheets icon in the tool bar and then select the Loan Amortization worksheet. Touch the **Loan Amount** field and then enter the following keystrokes on the keypad:

`250000 next`	*(Loan Amount = 250,000.00)*
`8.5 next`	*(Rate% = 8.5)*
`12 next`	*(Pmts/YR = 12)*
`20 =`	*(Years = 20)*

touch **Monthly** on the Compounding periods per year (C/Y) selector.

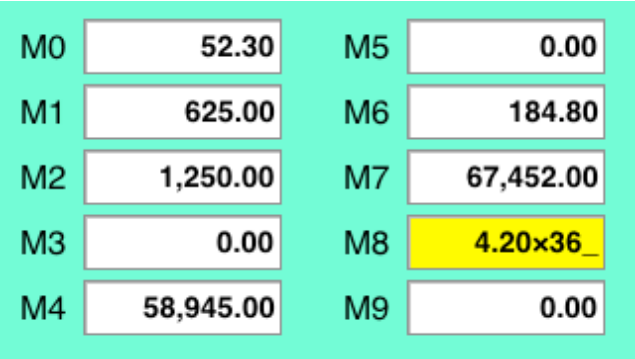
The monthly payments are -2,169.56 and the total interest over the life of the loan is 270,693.14.

example:
Compute a Canadian loan for the same loan as the above example. (Canadian loans compound twice a year).

touch the **Semi-Annual** segment of the Compounding periods per year (C/Y) selector.

The monthly payments are -2,146.40 and the total interest over the life of the loan is 265,134.64

Memory



The memory worksheet displays the 10 general calculator registers. You can review, change and perform calculations on a register.

Entry Fields

M0

the memory 0 edit field. Touch **M0** to display the keypad and edit the contents.

M1-M9

the edit fields for memory 1 - 9

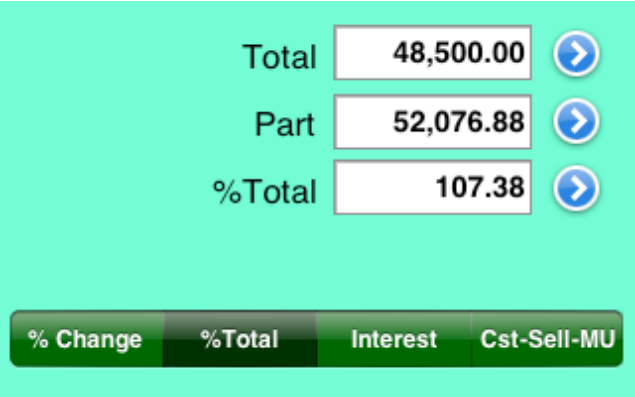
example:

compute and store the natural log of 4.25 in memory 2

touch the **M2** field and then enter the following keystrokes on the keypad:

`4.25 2nd LN` *(M2 = 1.45)*

Δ Percent



The Percent Change worksheet has 3 variations on computing the percent change from a starting value to an ending value. By choosing the appropriate selector, you can work %change, %markup or interest rate problems.

Selector

Touch the appropriate selector button for the type of problem to be solved. Choosing a problem type will relabel the input fields as appropriate for the problem type.

% Change
choose the % change selector to solve compute the percent change from an old value to a new value.

Interest
choose the interest selector for solving a compound interest problem involving a present value, future value and number of compounding periods.

Cost-Sell-Mkup
choose the Cost-Sell-Mkup selector for problems involving markups given the cost and selling price of goods.

Compute Buttons

Touch a compute button to solve for the specified variable. You must enter values for 2 components before solving for the 3rd in **%Change** and **Cost-Sell-Markup** problems. In **Interest** problems you must specify 3 components before solving for the 4th.

Entry Fields

The entry fields of this work sheet are relabeled depending on the type of problem being worked.

% Change Entry Fields

Enter any 2 values in the entry fields and touch the compute button of the 3rd to solve for a value.

Old value
the starting or old value of an asset

New value
the current or new value of an asset

% Change
the percent change from the old value to the new value

#Periods
this field is not used for %Change problems and is ignored.

example:
An exhibitor at the state fair estimated sales of 12,000. After the close of the fair, actual receipts totaled 13,545. What was the percentage change from the estimated to actual sales?

touch the **%Change** selector button
touch the **Old value** field then enter the following on the keypad:
`12000 next`
`13545`
touch the compute button next to the **% change** field

Receipts were 12.88% better than estimated.

example:
If rain had kept attendance down at the fair, sales could have been 3% less than the estimate. What would the sales figure have been?

using the same setup as above, touch the **%change** field then touch the following on the keypad:
`3 +/-`
touch the compute button next to the **New value** field to solve.

Receipts would have been 11,640 if it rained.

Interest Entry Fields

Enter any 3 values in the entry fields and touch the compute button of the 4th to solve for a value.

Present Value
the current value of an asset

Future Value
the value of an asset some time in the future

Interest%
the interest percentage representing the growth of the asset from the present value to the future value

#Periods
the number of compounding periods between the present and future values.

example:
You purchased a house for 356,000 and 8 years sold it for 510,000. What was the annual growth rate?

touch the **Interest** selector button
touch the **Present Value** field then enter the following on the keypad:
`356000 next` (Present Value = 356,000)
`510000 next` (Future Value = 510,000)
`next` (skip over the Interest% field)
`8` (#Periods = 8)
touch the compute button next to the **Interest%** field

The house appreciated at an annual rate of 4.6%

Cost-Sell-Mkup Entry Fields

Enter any 2 values in the entry fields and touch the compute button of the 3rd to solve for a value.

Cost
the cost of an asset or good

Selling Price
the selling price of an asset or good

% markup
the markup added to the cost to derive the selling price

#Periods

this field is not used for Cost-Sell-Markup problems and is ignored.

example:

A pool supply store buys chlorine for 8.00 per gallon bottle and sells it to the customer for 12.50. Find the markup.

touch the **Cost-Sell-Mkup** selector button
touch the **Cost** field then enter the following on the keypad:
`8 next` (Cost = 8.00)
`12.5 next` (Selling price = 12.50)
touch the compute button next to the **% markup** field

The markup is 56.25

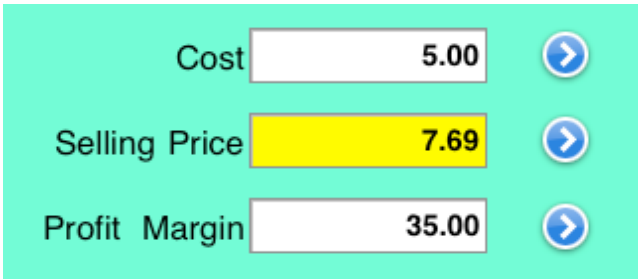
example:

A competitor opens a store 2 blocks down from the pool supplier and advertises that they will sell everything at cost plus 20%. What price will the pool supplier have to sell chlorine bottles for to match the competitor's price?

using the setup from the problem above, touch the % markup field and enter 20 using the keypad.
touch the compute button next to the Selling price field

The Selling price will be 9.60 to match the competitor.

Profit Margin



Compute cost, selling price and profit margin. Enter any 2 values and solve for the 3rd.

Entry Fields

Cost
the item cost
Selling Price
the selling price of the item
Profit Margin
the profit margin expressed as a percent

Compute Buttons

Cost
computes the cost given a Selling Price and Profit Margin

Selling Price
computes the selling price of the item given the Cost and Profit margin

Profit Margin
computes the profit margin given the Cost and Selling Price

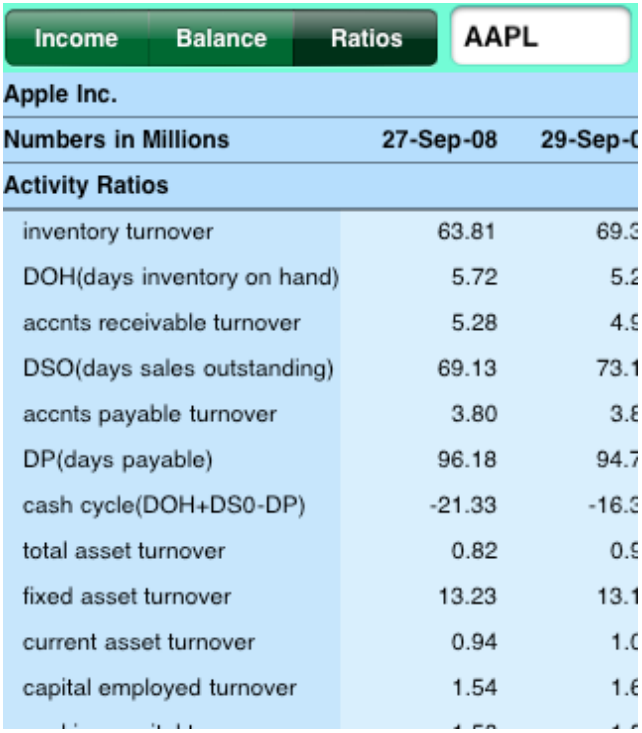
example:
The corner market gets beer from the distributer for 5.00 per six pack. The corner market needs to maintain a 35% profit margin to stay in business. How should the market price the six pack?

Touch the Worksheets icon in the tool bar. Then select the Profit Margin worksheet.
Touch the **Cost** field and then enter the following keystrokes on the keypad:

```
5 next          (Cost = 5.00)
next        (skip Selling Price)
35              (Profit Margin = 35)
```

then touch the **Selling Price** compute button.
The market needs to charge 7.69 to maintain a 35% profit margin.

Ratios



The Ratios worksheet is used to compute business ratios that are useful for analyzing a variety of aspects of a company. The worksheet has 3 main displays- an income statement, a balance statement and the ratios. Ratios are automatically computed from data in the income and balance statements. You can manually enter data for the income and balance statements or, if you have a web connection, you can download data for a variety of publicly traded companies.

(Please note that downloaded data is provided "as is" and may not be accurate. Please double check any downloaded data against a company's published financial statements.)

Selectors

Quarters/Years

Use the Quarters/Years selector to display either the last 4 quarters (if available) or the last 3 years of data.

Income/Balance/Ratios

Select from displaying the Income statement, Balance statement or the Ratios.

Text Entry Field

The text entry field at the top of the page is used for entering the stock market symbol for a company to download data for. Touch the text entry field then enter the stock market symbol, then touch the return key to initiate downloading the company data.

All data is provided "as is" for informational purposes only.

Income and Balance sheet notes

You can enter data in the income and balance sheets by touching the field you wish to modify. The selected field will turn yellow and the keypad will slide up. Touch the keys on the keypad to enter a value. Touch the next key or the = to finalize a value.

Fields that appear in bold text are automatically computed from other entries in the sheet and cannot be directly modified.

To clear the worksheet touch any field and then touch 2nd clr Work

Ratios sheet notes

The ratios display is automatically computed from entries in the income and balance statements and is not directly modifiable. The following is a description of the ratios and their derivation.

*Note: In the following descriptions, *working capital = Total Current Assets - Total Current Liabilities*

Activity Ratios

activity ratios relate information on a company's ability to manage its resources (ie. its assets) efficiently.

inventory turnover

Total Revenue / Inventory

#days receivable turnover

365 / inventory turnover

accounts receivable turnover

Net Income / Total Current Assets

total asset turnover

Total Revenue / Total Assets

fixed asset turnover

Total Revenue / Property Plant&Equipment

current asset turnover

Total Revenue / Total Current Assets

capital employed turnover

Total Revenue / Total Stockholder Equity

working capital turnover
Total Revenue / working capital

Leverage
leverage ratios provide information on the degree of a company's fixed financing obligations and its ability to satisfy these financing obligations.

gearing
Long Term Debt / Total Stockholder Equity

total debt to assets
Total Liabilities / Total Assets

long term debt to assets
Long Term Debt / Total Assets

total debt to equity
Total Liabilities / Total Stockholder Equity

Liquidity
liquidity ratios provide information on a company's ability to meet its short-term, immediate obligations.

current ratio
Total Current Assets / Total Current Liabilities

quick ratio / acid test
(Total Current Assets - Inventory) /
Total Current Liabilities

working capital to sales
working capital / Cost of Revenue

Management
ratios provide information on how well a company's management is doing.

ROCE % *return on capital employed*
Income Before Int.&Taxes /
(Total Assets - Total Current Liabilities) x 100

ROSF% *return on shareholders' funds*
Income Before Int. & Taxes /
Total Stockholder Equity x 100

ROTA% *return on total assets*
Income Before Int.&Taxes / Total Assets x 100

ROFA% *return on fixed assets*
Income Before Int. & Taxes /
Property Plant & Equipment x 100

ROWC% *return on working capital*
Income Before Int. & Taxes / working capital x 100

Profitability
ratios provide information on the amount of income from each dollar of sales.

gross profit margin %
Gross Profit / Total Revenue x 100

operating profit margin %
Operating Income or Loss / Total Revenue x 100

net profit margin %
Income Before Tax / Total Revenue x 100

retained profit margin %
Net Income / Total Revenue x 100

profit markup %
Gross Profit / Total Revenue x 100

profit before int&tax %
Earnings Before Int.&Taxes / Total Revenue x 100

profit before tax %
Income Before Tax / Total Revenue x 100

profit for the year %
Net Income / Total Revenue x 100

operating costs %
Total Operating Expenses / Total Revenue x 100

interest costs %
Interest Expense / Total Revenue x 100

Shareholder
ratios describe the company's financial condition in terms of amounts per share of stock.

EPS *earnings per share*
Net Income / Common Shares Outstanding

dividends/share
Dividends Paid / Common Shares Outstanding

dividend payout
Dividends Paid / Total Stockholder Equity

retention
(Total Stockholder Equity - Dividends Paid) /
Total Stockholder Equity

dividend cover
Net Income / Dividends Paid

interest cover
Income Before Tax / Interest Expense

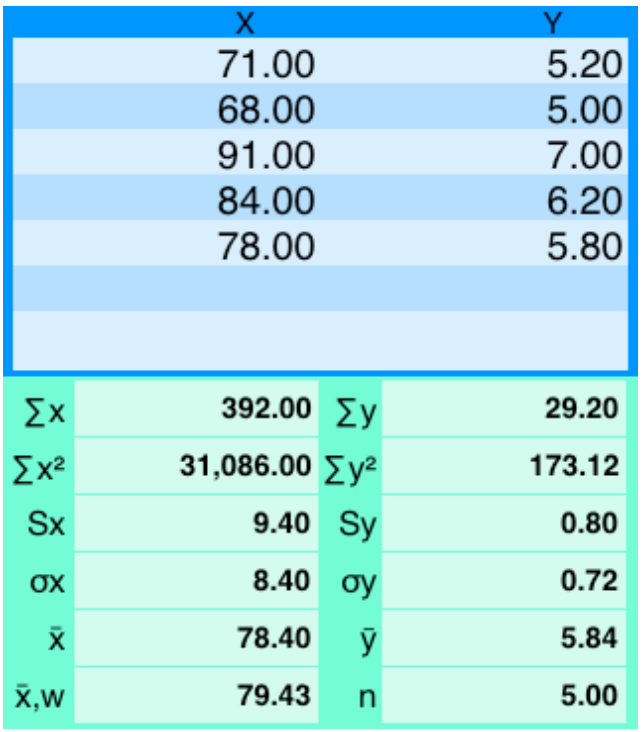
Statistics

Use the Statistics worksheet to enter and edit a data set and to compute a variety of statistics on the set. You can also do forecasting using linear, log, exponential or power fitting.

The Statistics worksheet has two screens, the editing screen and the forecasting screen. The forecast screen shows a plot of the data pairs and allows you to enter either an x or a y value and compute the opposite value using the selected model.

To switch between the two screens, touch the button in the lower left corner labeled either "Forecast" or "Edit" depending on which screen is displayed.

Edit Screen



X	Y
71.00	5.20
68.00	5.00
91.00	7.00
84.00	6.20
78.00	5.80

$\sum x$	392.00	$\sum y$	29.20
$\sum x^2$	31,086.00	$\sum y^2$	173.12
Sx	9.40	Sy	0.80
σx	8.40	σy	0.72
$\bar{x}$	78.40	$\bar{y}$	5.84
$\bar{x}$,w	79.43	n	5.00

The edit screen allows you to enter and edit up to 200
data pairs and view the statistics associated with them. All
statistics are computed as you enter or edit the values
in the data entry table.

Entry Fields

data entry table

touch the data entry table and enter data pairs. You can edit, insert and delete pairs using the keypad.

Result Fields

∑x the sum of the x values
∑y the sum of the y values
∑x² the sum of the x² values
∑y² the sum of the y² values
Sx the standard deviation of the x values
Sy the standard deviation of the y values
σx the population standard deviation of the x values
σy the population standard deviation of the y values
x̄ the mean of the x values
ȳ the mean of the y values
x̄,w the weighted mean of the x values
n the number of samples

example:

A fish and game warden logged the size and weight of salmon entering a fish ladder at the dam. In the first hour he recorded 5 fish with lengths of 71, 68, 91, 84 and 78 centimeters and weights of 5.3, 5, 7, 6.2, 5.8 kilograms. Find the mean, standard deviation and population standard deviation of the lengths and weights.

Touch the Worksheets tab and then select the Statistics worksheet.

Touch the data entry table and then on the keypad touch the following keys:

```
2nd clr Work
71 next 5.2 next
68 next 5 next
91 next 7 next
84 next 6.2 next
78 next 5.8 next
2nd done
```

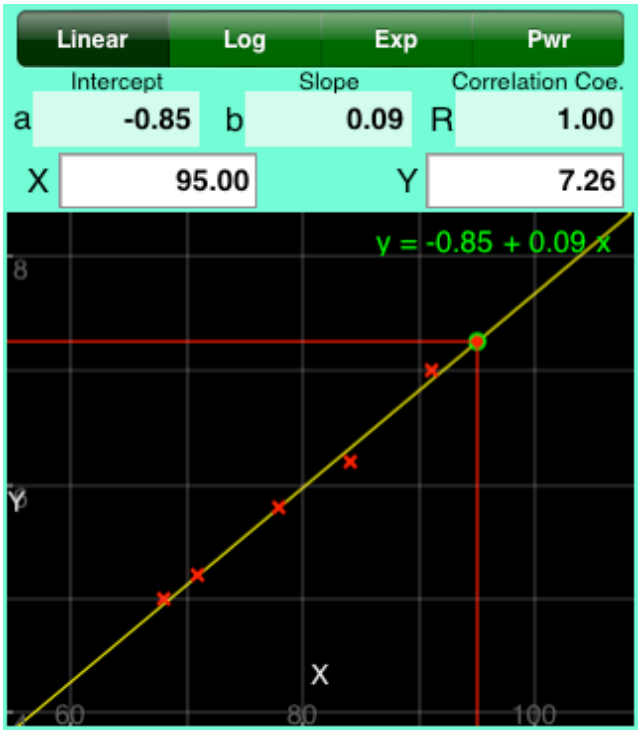
To review the results on the Tape, touch the Print button and then touch the Tape tab at the top of the screen.

```
          X                Y
      71.00            5.20
      68.00            5.00
      91.00            7.00
      84.00            6.20
      78.00            5.80

    392.00 ∑x
```

```
31,086.00 ∑x²
    29.20 ∑y
   173.12 ∑y²
 2,319.40 ∑xy
     5.00 N
    78.40 x mean
     5.84 y mean
     9.40 Sx
     0.80 Sy
     8.40 σx
     0.73 σy
    79.43 x,w
```

Forecast Screen



The forecast display draws the current samples as red x's and a yellow fit line on a cartesian plane. You can scroll the plot using a finger swipe motion. The axis scales can be adjusted independently using a pinch gesture.

To compute a forecasted value using the current curve fit model, touch either the x or y edit field. A numeric keypad will appear. Enter the value and touch the Done key. The forecast value will be computed and displayed in the opposite edit field. The forecast point will be displayed on the fit curve circled in green.

Immediately below the edit fields is a green display of the currently selected fit model. In the upper right corner of the display the correlation coefficient of the current fit model is displayed in green.

Selector

Choose from 4 different fit models using the model selector at the top:

Linear	computes and draws a linear curve fit y = b + mx
Log	computes and draws a logarithmic curve fit y = b + m ln x
Exp	computes and draws an exponential curve fit y = b e^mx

Pwr computes and draws a power curve fit
y = bx^m

Entry Fields

X

Enter an X value and a value for Y will be computed using the current fit model

Y

Enter an Y value and a value for X will be computed using the current fit model

Result Fields

a

the y intercept value using the selected fit model

b

the slope value using the selected fit model

R

the correlation coefficient value

example:

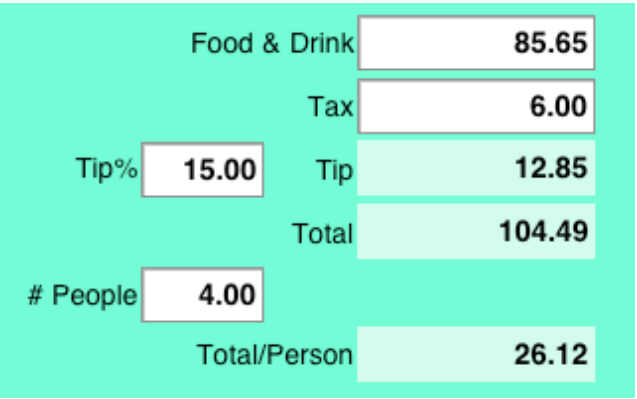
Using the fish samples entered in the above example, compute a linear estimate for the weight of a fish 95 centimeters long.

Touch the Linear model button.
Touch the X entry field and enter the following keystrokes on the keypad:

```
95 =
```

The estimated weight for a fish 95 cm long is 7.26 kg.

Tip



Compute a tip for service. All compute fields are automatically updated as you enter values in the entry fields.

Entry Fields

Food & Drink
the cost of your meal

Tax
the amount of tax added to the meal cost

Tip%
the tip percentage to compute

#People
the number of people in your party that will split the bill

Result Fields

Tip
the tip amount (Food&Drink * Tip% / 100)

Total
the bill total (Fodd&Drink + Tax + Tip)

Total/Person
the amount each person in the party should pay (Total / #People)

example:
You and 3 friends have dinner at the El Tacorito restaurant. At the end of the dinner, the waiter presents you with a bill for $95.00 for food and drink with $6.45 in tax. Everyone agrees the service was good and should be computed at 15%. If you split the bill evenly, how much does each person

in your party owe?

touch the Worksheets tool and select the Tip worksheet.

touch the Food & Drink field and then enter the following:

`95 next` *(Food & Drink = 95.00)*
`6.45 next` *(Tax = 6.45)*
`15 next` *(Tip% = 15)*
`4 =` *(# People = 4)*

The tip comes out to $14.25. The total bill is $115.70
Each person in your party owes $28.93

Sample Problems

Setting up the calculator

The following steps should be used before working any problem.

1. Set the number of decimal places
Touch **2nd disp** followed by the number of decimal places you want to view. For most situations, set this to 2 decimal places by touching: **`2nd disp 2`**

2. Set the number of payments per year (P/Y)
Touch **2nd P/Y** followed by the number of payments per year. The new value is displayed in **green** next to the P/Y label so you can easily see what the current setting is. When you change the P/Y value, the compounding periods per year (C/Y) is automatically set to the same value.

3. Set the annuity due (BGN) and ordinary annuity (END) mode
The current setting of the mode is displayed under the PMT key. To change it, touch **2nd** PMT. The value will alternate between BGN and END each time you invoke this function.

4. Clear the time value of money registers
Touch **2nd Clr TVM** This function clears N, I/Y, PV, PMT and FV, but leaves P/Y and C/Y at their current settings.

5. Reset the calculator
Touch **2nd reset** to clear memory and the calculator to the factory default settings. If you are unsure of the current state of your calculator or are getting unexpected results, use this function to return to the baseline calculator setup.

6. Clear the worksheet variables
Before using any worksheet, touch 2nd clr Work on the keypad. This will clear the variables in the worksheet to the default values.

Time Value of Money (TVM) Computations

Lump Sums

Lump sum computations take into consideration the change in value over time of a single sum invested at a given rate of return. These type of problems involve the 4 basic variables:

N the life of the investment
I/Y the interest rate
PV the present or starting value of the investment
FV the future or ending value of the investment

Enter any three of the variables and then solve for the 4th variable.

1. Future Value (FV)

If you have $5,000 to invest at 6.5% per year, how much would your investment be worth at the end of 6 years?

If the calculator screen is not already displayed, touch the Calculator icon in the tool bar at the top of the screen. Then touch the following keys:

2nd reset *clear the calculator to defaults*
5 N *set the number of periods to 5*
6.5 I/Y *set the interest rate to 6.5*
5000+/- PV *set the present value to -5,000*
CPT FV *compute the future value*

The result is 6,850.43

2. Present Value (PV)

Your daughter will be attending college in 12 years and you have determined that she will need $125,000 to pay for tuition, room and board and books. If you can earn an average annual rate of return of 6% per year, how much money would you need to invest today as a lump sum?

Touch the following keys:

2nd reset *clear the calculator to defaults*
12 N *set the number of periods to 5*
6 I/Y *set the interest rate to 6*
125000 FV *set the future value to 125,000*
CPT PV *compute the present value*

The result is -62,121.17. Note that the result is negative. Cash flows that are paid out are generally specified as a negative value and cash returned as a positive value. In this case, you pay some amount of money into an investment (negative amount) and receive an amount some time in the future (a positive amount).

3. Number of Periods (N)

If your daughter were to attend a private college the expenses would be greater than the above example. You estimate that she would need $200,000. If you have $60,000 to invest at 8%, how many years before she attends college would you have to begin her college savings plan?

Touch the following keys:

2nd reset	*clear the calculator to defaults*
8 I/Y	*set the interest rate to 8*
60000+/- PV	*set the present value to -60,000*
200000 FV	*set the future value to 200,000*
CPT N	*compute the number of years*

You will have to start the savings plan 15.64 years before she attends college.

3. Interest Rate (I/YR)

You have financial commitments that prevent you from investing in your daughter's college fund until 12 years before she will attend college. At that time you will be able to invest $70,000. What interest rate will be required for her fund to grow to $125,000 in time for her to attend college?

Touch the following keys:

2nd reset	*clear the calculator to defaults*
12 N	*set the number of years to 12*
70000+/- PV	*set the present value to -70,000*
125000 FV	*set the future value to 125,000*
CPT I/Y	*compute the interest rate*

You will need to find an investment that returns 4.95% to attain your goal.

Regular Annuities

A regular annuity is a series of equal cash flows occurring at equally spaced time intervals. In a regular annuity, the first cash flow occurs at the **END** of the first period. An annuity due is similar to a regular annuity, except that the first cash flow occurs immediately (**BGN**).

Similar to the lump sum computations, the annuity calculations involve the N, I/Y, PV and FV variables. In addition, they include the PMT variable. To compute an annuity problem, you must enter 4 of the following 5 variables before solving for the 5th:

N	the life of the investment
I/Y	the interest rate
PV	the present or starting value of the investment
FV	the future or ending value of the investment
PMT	the regular payment

1. Future Value (FV)

If you are making a regular payment and want to compute the sum of the payments with interest some time in the future you need to solve for Future Value.

You can set aside $5,000 per year towards your daughter's college fund. If you establish her fund 10 years before she attends college and receive an average annual rate of return of 5.6%, how much money will she have for paying her expenses?

Touch the following keys:

2nd reset *clear the calculator to defaults*
10 N *set the number of periods to 10*
5.6 I/Y *set the interest rate to 5.6*
5000+/- PMT *set the payment to -5,000*
CPT FV *compute the future value*

She will have $64,678.99. Note that the payment is specified as a negative amount because it is a cash outflow from your pocket to the savings plan.

Suppose you establish the savings plan the same as above, but make monthly contributions of $420. How much money will be accumulated at the end of 10 years?

Touch the following keys:

2nd reset *clear the calculator to defaults*
12 2nd P/Y *set the # payments per year to 12*
10 2nd ×P/Y *set the # of periods to 10 × 12 = 120*
5.6 I/Y *set the interest rate to 5.6*
420+/- PMT *set the payment to -420*
CPT FV *compute the future value*

She will have $67,355.42.
Note: the **2nd ×P/Y (**the shift function of the N key) multiplies the value in the display by the current P/Y value and stores the result in the N variable. This is a short cut for entering N when the number of payments per year is greater than 1. You could have computed the value in your head and entered 120 N instead.

2. Payment (PMT)
Solving for an annuity payment is the process used for computing a home or car loan payment or for determining the the amount you need to save each year to reach a financial goal.

You are about to purchase a new home. The selling price is $375,000 and the bank is willing to loan you the money at an annual interest rate of 7.2%. What will your monthly payments be on a 15 year loan?

Touch the following keys:

2nd reset *clear the calculator to defaults*
12 2nd P/Y *set the # payments per year to 12*
15 2nd ×P/Y *set the # of periods to 10 × 15 = 180*

7.2 I/Y *set the interest rate to 7.2*
375000 PV *set the present value to 375,000*
0 FV *you will pay the loan to 0 in the future*
CPT PMT *compute the future value*

Your monthly payments will be -3,412.68

An alternative way to solve this problem is to use the Loan Amortization worksheet. Touch the Worksheets icon in the tool bar at the top of the screen twice. Then touch the Loan Amortization to display the Loan worksheet. You will notice that the values from the above problem have already been filled in except for the Years value. Touch the Years field and enter 15 using the popup keypad. Touch 2nd done (2nd 2nd) to dismiss the keypad. The payment schedule is displayed in a scrolling list showing the interest paid, principal paid and remaining balance for each payment. The total amount of interest paid over the life of the loan is show in the Interest Paid field just above the list.

You live in Canada and need to compute the above loan using a Canadian loan. (Canadian loans compound semi annually.) What is your payment?

Using the Loan Amortization worksheet as setup above, touch the Semi-Annual button of the compounding periods per year (C/Y) selector. Your payment will be -3,390.41.

Touch the Calculator icon in the tool bar to return to the calculator. Notice that the C/Y value has been changed to 2.

3. Number of Periods (N)
If you need to find out how long it will take, you are solving for the number of periods.

You have retirement savings of $1,200,000. You have determined that you need $85,000 per year to live on. If you expect to earn 5.6% per year on average, how many years will your retirement fund last?

Touch the following keys:

2nd reset *clear the calculator to defaults*
5.6 I/Y *set the interest rate to 5.6*
1200000+/- PV *set the present value to -1,200,000*
85000 PMT *set the payment to 85,000*
CPT N *compute the number of payments*

Your retirement fund will last 28.69 years.

4. Interest Rate (I/Y)

You are offered an investment that costs $50,000 that will pay 5,000 per year for 15 years. At the end of the 15 years it can be redeemed for 10,000. What is your annual rate of return?

Touch the following keys:

2nd reset *clear the calculator to defaults*
15 N *set the number of years to 15*
50000+/-PV *set the present value to 50,000*
5000 PMT *set the payment to 5,000*
10000 FV *set the future value to 10,000*
CPT I/Y *compute the interest rate*

The investment returns 6.76% annually.

5. Annuity Due
Annuities due differ from ordinary annuities because the first payment is made at the beginning of the year instead of the end. To solve annuity due problems, you must change the end/begin computation mode to begin. You do this by touching **2nd** PMT until the blue label shows **BGN**.

You are about to purchase a new home. The selling price is $375,000 and the bank is willing to loan you the money at an annual interest rate of 7.2%. What will your monthly payments be on a 15 year loan?

Touch the following keys:

2nd reset *clear the calculator to defaults*
12 2nd P/Y *set the # payments per year to 12*
15 2nd ×P/Y *set the # of periods to 10 × 15 = 180*
7.2 I/Y *set the interest rate to 7.2*
375000 PV *set the present value to 375,000*
0 FV *you will pay the loan to 0 in the future*
CPT PMT *compute the payment*

Your monthly payments will be -3,412.68

What will your payments be if you make the payments at the beginning of each month instead of the end of the month?

Using the same setup as above, change the end/begin mode to begin by touching 2nd PMT. The blue label should show BGN. Solve for payment:

CPT PMT *compute the future value*

Your monthly payments will be -3,392.32. By making payments early, you save 20.35 per payment.