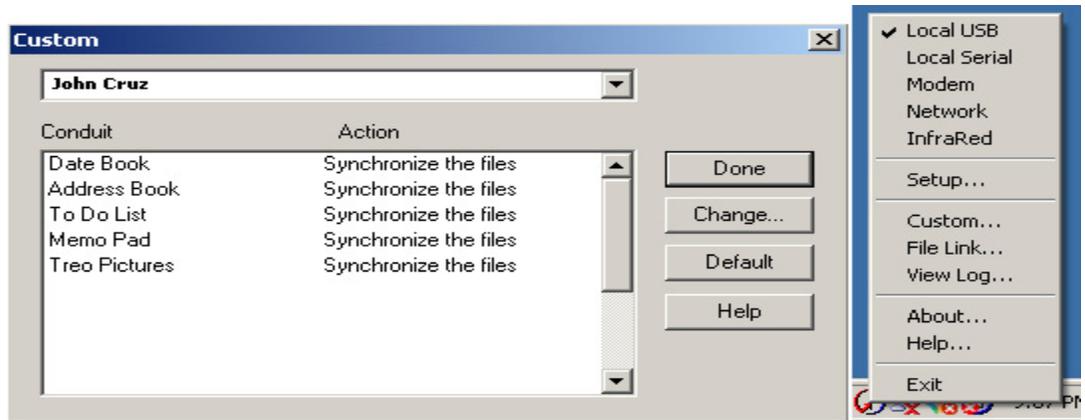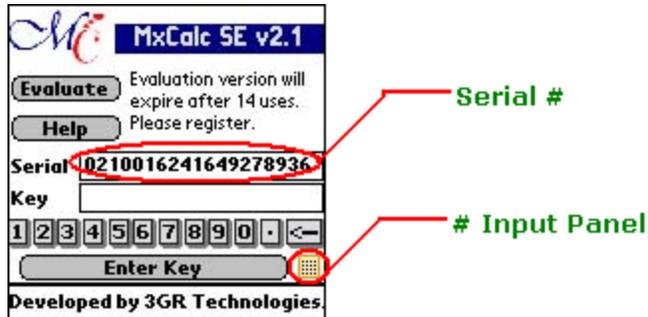# MxCalc 12c

for Palm OS

Version 1.2
User Guide

Product of :-

3GR Technologies

For Installation information & Sales/Support contacts refer the Read Me file.

Registration

To register you will need the HotSync ID. You can locate the HotSync ID as shown above. Select 'Custom' by clicking on the HotSync Icon in the System Tray.

In the above example 'John Cruz' is the HotSync ID.

Enter the key provided with your purchase (or later via email) in the input area below the serial # and tap on 'Enter Key' button.

Frequently asked questions

? [What is the [STK] button for?](#)
? [How do I change the number of decimal places?](#)

Questions:

1. What is the [STK] button for?
Answer:
The [STK] button is used to show a window displaying the contents of all the financial and storage registers. Press [g][STK] to show the form.

2. How do I change the number of decimal places?
Answer:
Press [f] followed by a digit as the number of decimal places used in the display. For instance, to set the display to use 2 decimal places, press [f][2].

You can set the display to use from 0 to 9 decimal places. Pressing [f][.] will set the display to use the scientific notation.

Error messages

Error 0
Invalid Math operations such as : -

1> division by zero

2>square root of a negative number

3> log of zero or negative number

4> factorial of a non-integer or negative number.

Error 1
Overflow in storage register.

Error 2
Statistics operation error such as : -

1> taking an average when no Data exists

Error 3
IRR error.

Error 4
Entered more than 399 lines of program steps.

Error 5

1>Compound interest error

2> Invalid values supplied for n, i , PV, PMT, FV such that there is no solution.

Error 6
Storage registers error.

Error 7
IRR error.

Error 8
Improper date format or dates are outside the valid range (1901 to 2100).

Examples

NOTE: Most of the examples assume the calculator is in RPN mode, although many will also work when the calculator is in ALG mode. Press [f][ALG] to work in ALG mode (the ALG annunciator is displayed). Press [f][RPN] to work in RPN mode (the ALG annunciator is absent). The default setting for the calculator is RPN.

Simple Arithmetic

✍ 13 + 5 = ?

1. Key in 13
2. Press [ENTER]
3. Key in 5
4. Press [+]. The result is 18.00

✍ 199 - 60 = ?

1. Key in 199
2. Press [ENTER]
3. Key in 60
4. Press [-]. The result is 139.00

✍ 99 × 5 = ?

1. Key in 99
2. Press [ENTER]
3. Key in 5
4. Press [×]. The output is 495.00

✎ 5874 ÷ 178 = ?

1. Key in 5874
2. Press [ENTER]
3. Key in 178
4. Press [÷]. The output is 33.00

✎ 9 × (6 + 4) = ?

1. Key in 6
2. Press [ENTER]
3. Key in 4
4. Press [+]
5. Key in 9
6. Press [×]. The output is 90.00

✎ (29 + 7) ÷ (20 - 8) = ?

1. Key in 29
2. Press [ENTER]
3. Key in 7
4. Press [+]
5. Key in 20
6. Press [ENTER]
7. Key in 8
8. Press [-]
9. Press [÷]. The output is 3.00

✎ 3 × (19 + 13) ÷ 8 = ?

1. Key in 3
2. Press [ENTER]
3. Key in 19
4. Press [ENTER]
5. Key in 13
6. Press [+]
7. Press [×]
8. Key in 8
9. Press [÷]. The output is 12.00

✎ (20 - 2) × (2 + 3 - 8) ÷ 18 = ?

1. Key in 20
2. Press [ENTER]
3. Key in 2
4. Press [-]
5. Key in 2
6. Press [ENTER]
7. Key in 3
8. Press [+]

9. Key in 8
10. Key in [-]
11. Press [×]
12. Key in 18
13. Press [÷]. The output is -3.00

More math calculations

✍ √225 = ?

1. Key in 225
2. Press [g][√x]. The output is 15.00

✍ 5^3 = ?

1. Key in 5
2. Press [ENTER]
3. Key in 3
4. Press [y^x]. The output is 125.00

✍ $(4 + 3)^7$ = ?

1. Key in 4
2. Press [ENTER]
3. Key in 3
4. Press [+]
5. Key in 7
6. Press [y^x]. The output is 16807.00

✍ ln 40 = ?

1. Key in 40
2. Press [g][LN]. The output is 3.68.

✍ $e^{2.1}$ = ?

1. Key in 2.1
2. Press [g][e^x]. The output is 8.17.

✍ Integer part of 99.35 = ?

1. Key in 99.35
2. Press [g][INTG]. The output is 99

✍ Fractional part of 99.35 = ?

1. Key in 99.35
2. Press [g][FRAC]. The output is 0.35.

Percentages

✍ 20% of 2500 = ?

1. Key in 2500
2. Press [ENTER]
3. Key in 20
4. Press [%]. The output is 500.00.

✍ What is the percentage change between 60 and 150?

1. Key in 60
2. Press [ENTER]
3. Key in 150
4. Press [?%]. The result is 150.00%.

✍ What percentage is 50 of 20?

1. Key in 50
2. Press [ENTER]
3. Key in 20
4. Press [%T]. The output is 40.00%.

Interests

Simple Interest

✍ Find the interest earned if $20,000 is invested for 25 days at 5% p.a.

1. Press [f][FIN] to clear the financial registers.
2. Key in 20000 then press [CHS][PV]
3. Key in 25 then press [n]
4. Key in 5 then press [i]
5. Press [f][INT]. The interest accrued on a 360-day basis is $69.44 Press [RDown][X<>Y] to display the interest accrued on a 365-day basis, $68.49. Press [+] to display the total of the principal and accrued interest on the display, $20268.49.

Compound Interest

? **$25,000 is placed in an account earning 9% compounded monthly. What is the future value after 10 years?**

1. Press [f][FIN] to clear the financial registers.
2. Key in 25000 then press [CHS][PV]
3. Key in 9 then press [g][12÷]
4. Key in 10 then press [g][12×]
5. Press [FV]. The result is $61,283.93.

? **You would like to have $90,000 twenty years from today. How much should you invest today if interest rate is 5% p.a. compounded monthly?**

1. Press [f][FIN] to clear the financial registers.
2. Key in 90000 then press [FV]
3. Key in 5 then press [g][12÷]
4. Key in 20 then press [g][12×]
5. Press [PV]. The result is -$33,920.05.

? **If $5000 invested today will amount to $9,800 in 12 years, what is the p.a. interest rate compounded quarterly?**

1. Press [f][FIN] to clear the financial registers.
2. Key in 5000 then press [CHS][PV]
3. Key in 9800 then press [FV]
4. Key in 12 then press [ENTER]
5. Key in 4 then press [×][n]
6. Press [i] then [4][×]. The result is 5.65%.

? **You had a loan of $15,000 that began accruing interest on January 29, 2002. Find the p.a. interest rate if you needed to make 20 monthly payments of $775. Payments began on February 14, 2002 and compound interest is used for the odd period.**

1. Press [f][FIN] to clear the financial registers.
2. Press [STO][EEX] to indicate compound interest being used during the odd period.
3. Key in 15000 then press [PV]
4. Key in 775 the press [CHS][PMT]
5. Press [g][M.DY] to use month-day-year format.
6. Key in 1.292002 then press [ENTER]
7. Key in 2.142002 then press [g][?DYS]
8. Key in 30 then press [÷]
9. Key in 20 then press [+][n]
10. Press [i] then press [12][×]. The result is 3.59%.

NPV AND IRR

✍ Suppose there is a project producing $300,000 in the first year, $270,000, and $800,000 in the third year. If cost of capital is 10.5%, calculate the NPV of the project.

1. Press [f][FIN] to clear the financial registers.
2. Key in 0 then press [g][g][CF$_o$] since there is no initial cash flow.
3. Key in 300000 then press [g][CF$_j$]
4. Key in 270000 then press [g][CF$_j$]
5. Key in 800000 then press [g][CF$_j$]
6. Key in 10.5 then press [i]
7. Press [f][NPV]. The result is $1,085,548.53.

✍ You would like to purchase a business for $90,000 and anticipate cash flows of $15,000 in the first year, $12,000 in the second and third years, $27,000 in the fourth and fifth years, and $29,000 in the final sixth year. Calculate the internal rate of return of the investment.

1. Press [f][FIN] to clear the financial registers.
2. Key in 90000 then press [CHS][g][CF$_o$]
3. Key in 15000 then press [g][CF$_j$]
4. Key in 12000 then press [g][CF$_j$]
5. Key in 2 then press [g][N$_j$]
6. Key in 27000 then press [g][CF$_j$]
7. Key in 2 then press [g][N$_j$]
8. Key in 29000 then press [g][CF$_j$]
9. Press [f][IRR]. The result is 8.06%.

Depreciations

Question: An equipment costing $33,000 is estimated to have a useful life of 5 years and a scrap value of $2,000. Using the straight line method find the depreciation after the second year and the remaining depreciable value.

Answer:

1. Press [f][FIN] to clear the financial registers.
2. Key in 33000 then press [PV]
3. Key in 2000 then press [FV]

4. Key in 5 then press [n]
5. Key in 2 then press [f][SL]. The result is $6,200. Press [X<>Y] to display the remaining depreciable value, $18,600.

Question: A company has purchased a machinery at a cost of $100,000. If the machinery will have a useful life of 10 years and no salvage value, find the depreciation after the first and second year using the sum of years digits methods.

Answer:

1. Press [f][FIN] to clear the financial registers.
2. Key in 100000 then press [PV]
3. Key in 0 then press [FV]
4. Key in 10 then press [n]
5. Key in 1 then press [f][SOYD] to display the depreciation for the first year, $18,181.82.
6. Key in 2 then press [f][SOYD] to display the depreciation for the second year, $16,363.64.

Question: A company has purchased a car for $25,000. If the car is to be depreciated over 5 years and the salvage value is $10,000, calculate the depreciation for the first year using the *double* declining balance method.

Answer:

1. Press [f][FIN] to clear the financial registers.
2. Key in 25000 then press [PV]
3. Key in 10000 then press [FV]
4. Key in 5 then press [n]
5. Key in 200 then press [i] to enter the declining balance factor.
6. Key in 1 then press [f][DB]. The result is $10,000.

Annuities

✎ Suppose you decide to invest $5,500 at the beginning of each month in a company paying an interest of 3.5% p.a. compounded monthly. Find the worth of the investment at the end of 8 years.

1. Press [f][FIN] to clear the financial registers.
2. Press [g][BEG] to set payments to begin mo de.
3. Key in 5500 then press [CHS][PMT]
4. Key in 3.5 then press [g][12÷]

5. Key in 8 then press [g][12×]
6. Press [FV]. The result is $610088.12.

? You would like to have $9,800 in 12 months time to purchase a new stereo. Assuming that money earns interest at 4% p.a. compounded monthly, how much should you invest at the end of each month in order to accumulate the required amount?

1. Press [f][FIN] to clear the financial registers.
2. Press [g][END] to set payments to begin mode.
3. Key in 9800 then press [FV]
4. Key in 12 then press [n]
5. Key in 4 then press [g][12÷]
6. Press [PMT]. The result is -$801.80.

? What amount should you deposit today to an account paying interest at 8.25% p.a. compounded annually, so that you can withdraw $55,000 at the beginning of each year for the next 25 years?

1. Press [f][FIN] to clear the financial registers.
2. Press [g][BEG] to set payments to begin mode.
3. Key in 55000 then press [PMT]
4. Key in 25 then press [n]
5. Key in 8.25 then press [i]
6. Press [PV]. The result is -$622208.82.

? Suppose you borrow $505,000 from a bank at 8.5% p.a. compounded monthly. If you are to repay the loan in equal monthly payments at the end of each month for the next 7 years, calculate the cost of each payment.

1. Press [f][FIN] to clear the financial registers.
2. Press [g][END] to set payments to begin mode.
3. Key in 505,000 then press [PV]
4. Key in 8.5 then press [g][12÷]
5. Key in 7 then press [g][12×]
6. Press [PMT]. The result is -$7997.42.

Normal Distribution

? Find the area under the standard normal curve for z < 1.5

1. Press 1.5
2. Press [g][N(z)]. The result is 0.933192.

✍ Find the area under the standard normal curve for 0 < z < 1.5

1. Press 1.5
2. Press [g][N(z)]
3. Key in 0.5 then press [-]. The result is 0.43319.

✍ Find the area under the standard normal curve for z < -3.5

1. Key in 3.5 then press [CHS]
2. Press [g][N(z)]. The result is 0.00023.

✍ Find the area under the standard normal curve for z > 2.25

1. Press 2.25
2. Press [g][N(z)]
3. Press [X<>Y]. The result is 0.01222

✍ Find z_o such that the area under the standard normal curve for z < z_o is 0.73.

1. Press 0.73
2. Press [g][z]. The result is 0.61281

Bonds Prices and Yields

✍ A semi-annual bond maturing on March 28, 2015 bears 8% p.a. Find the purchase price of the bond on March 28, 2002 if you desire a yield of 6%.

1. Press [f][FIN] to clear the financial registers.
2. Press [g][M.DY] to use month-day-year format.
3. Key in 6 then press [PMT]
4. Key in 8 then press [i]
5. Key in 3.282002 then press [ENTER]
6. Key in 3.282010 then press [f][PRICE]. The result is $88.34.

✍ A semi-annual bond maturing on September 11, 2020 bears 9.5% p.a. Calculate the yield of the bond if the price on feb 16, 2005 is $92.

1. Press [f][FIN] to clear the financial registers.
2. Press [g][M.DY] to use month-day-year format.
3. Key in 9.5 then press [PMT]
4. Key in 92 then press [PV]
5. Key in 2.162005 then press [ENTER]
6. Key in 9.112020 then press [f][YTM]. The result is $10.55.

Statistics

? Find the mean and sample standard deviation of the following data: 13, 15, 21, 9, 20, 15.

1. Press [f][?] to clear the statistical registers.
2. Key in 13 then press [?+]
3. Key in 15 then press [?+]
4. Key in 21 then press [?+]
5. Key in 9 then press [?+]
6. Key in 20 then press [?+]
7. Key in 15 then press [?+]
8. Press [g][x] to calculate the mean, 15.5.
9. Press [g][S] to calculate the sample standard deviation, 4.46.

? For the following data, calculate the average of X, standard deviation of X, average of Y, and the standard deviation of Y. Estimate Y when X is 8.

X: 10   13   15   19   11
Y: 15   16   22   25   28

1. Press [f][?] to clear the statistical registers.
2. Key in 15 then press [ENTER]
3. Key in 10 then press [?+]
4. Key in 16 then press [ENTER]
5. Key in 13 then press [?+]
6. Key in 22 then press [ENTER]
7. Key in 15 then press [?+]
8. Key in 25 then press [ENTER]
9. Key in 19 then press [?+]
10. Key in 28 then press [ENTER]
11. Key in 11 then press [?+]
12. Press[g][x] to calculate the average of X, 13.6.
13. Press [X<>Y] to display the average of Y, 21.20.
14. Press [g][S] to display the standard deviation of X, 3.577.
15. Press [X<>Y] to display the standard deviation of Y, 5.63.
16. Key in 8 then press [g][y, r] to calculate Y estimate, 17.98.
17. Press [RDown] to calculate the sample coefficient of determination,0.36.

Dates Calculations

✍ Find the number of days between September 15, 1970 and Feb 20, 1962.

1. Press [g][M.DY] to use month-day-year format.
2. Key in 2.201962 then press [ENTER]
3. Key in 9.151970 then press [g][?DYS]. The result is 3128

✍ What day was October 19, 1950.

1. Press [g][M.DY] to use month-day-year format.
2. Key in 10.191950 then press [ENTER]
3. Key in 0 then press [g][DATE]. The result is 10,19,1950 4 or October 19, 1950. Digit 4 at the end means it was Thursday. (1 = Mon, 2 = Tue, and so on with 7 = Sun).

✍ Find the day 100 days from August 17, 1945.

1. Press [g][M.DY] to use month-day-year format.
2. Key in 8.171945 then press [ENTER]
3. Key in 100 then press [g][DATE]. The result is 11,25,1945 7 or November 25, 1945. Digit 7 at the end means it was Sunday.

MxCalc 12C Programming

✍ How do I clear all the programs?

1. Press [f][P/R] to enter into program mode.
2. Press [f][PRGM] to clear all previously stored program.
3. Press [f][P/R] to exit from program mode.

✍ Write a program to calculate 8 + 2.

1. Press [f][P/R] to enter into program mode.
2. Key in 8 then press [ENTER]
3. Key in 2 then press [+]
4. Press [g][GTO] then press [0][0] to indicate end of program.
5. Press [f][P/R] to exit from program mode. To run the program press [R/S]. The result is 10.

✍ Write a program to add the numbers in data storage register 0 and data storage register 1 then display the result.

1. Press [f][P/R] to enter into program mode.

2. Press [RCL][0] then press [ENTER]
3. Press [RCL][1] then press [+]
4. Press [g][GTO] then press [0][0] to indicate end of program.
5. Press [f][P/R] to exit from program mode.

Suppose we would like to calculate 90 + 10. First key in 90 then press [STO][0]. Key in 10 then press [STO][1]. Press [R/S] to run the program. The result is 100.

LIST OF FEATURES

DISPLAY:
main display
stack registers display
data registers display

DISPLAY FORMAT:
fixed
scientific

ORIENTATION:
portrait
landscape

LOGIC:
Reverse Polish Notation (RPN)
Algebraic (ALG)

STACK LEVELS:
4 and Last-X

DATA REGISTERS:
20

STORAGE,RECALL
yes

MATH OPERATORS:
$\div$, X, +, -
$1/x$, v, LN, e^x, y^x
%, %T, ?%
INTG, FRAC

STAT FUNCTIONS:
mean
standard deviation
Sn, Sx, Sx^2, Sxy, Sy^2
linear regression

coeff. of determination
factorial
normal distribution

DATE CALCULATIONS:

yes (from 1901 to 2100)

DATE FORMAT:

D.MY (day-month-year)
M.DY (month-day-year)

TIME VALUE OF MONEY:

n, i, PV, PMT, FV

CASH FLOWS ANALYSIS:

NPV, IRR

AMORTIZATION:

accumulated interest
balance

DEPRECIATION:

straight line method
sum of years digits
declining balance

BONDS CALCULATION:

price
yields
accrued interest

PROGRAMMING:

399 program steps
2 conditional tests
line number addressing
pause
single step

Functions Reference

<-	backspace
-	subtraction
?%	percent of change
%	percent of
%T	percent of total
+	addition
×	multiplication
÷	division
S	clear statistical registers
S-	subtraction from statistics
S+	addition to statistics
0,...,9	number digits
1/x	reciprocal
12×	multiply by 12 and store into n
12÷	divide by 12 and store into i
ALG	algebraic mode
AMRT	amortization
BEG	set payment mode to begin
BST	back step
CF_o	initial cash flow
CF_j	next cash flow
CHS	change sign
CLx	clear the number displayed (X-register)
DATE	calculate new date
DB	declining balance method of depreciation
D.MY	set date mode to day-month-year
?DYS	number of days
EEX	enter exponent
END	set payment mode to end
ENTER	terminate digit entry and push the number
EXIT	close the calculator
e^x	raise e to the power of x
f	access gold colored function
FIN	clear financial registers
FRAC	fractional part
FV	future value
g	access blue colored function
GTO	goto
I	interest

INT	calculate simple interest
INTG	integer part
IRR	calculate internal rate of return
LN	natural log
LSTx	last x
M.DY	set date mode to month-day-year
n	number of periods
n!	factorial
N_j	number of cash flows
NPV	net present value
N(z)	standard normal cumulative distribution
PMT	payment
P/R	program/run toggle
PRICE	bond price
PRGM	clear all programs
PSE	pause for about one second
PV	present value
RCL	recall from data storage register
RDown	roll down stack registers
REG	clear all registers
RND	round to match display
RPN	rpn mode
R/S	Run/Stop toggle
SHOW	show the financial and storage registers
SL	straight line method of depreciation
SOYD	sum of years digits method of depreciation
SST	single step
STO	store into data storage register
√x	square root of
X=0	conditional branching
x,r	estimate using linear regression
xw	weighted average
X=Y	conditional branching
X<>Y	exchange contents of X-register and Y-register
y,r	estimate using linear regression
YTM	yield to maturity
y^x	power
z	inverse of standard normal cumulative distribution