

WELCOME TO THE LOAN AMORTIZATION BASIC SKILLS MODEL

--

This worksheet has been developed and published for the Twin Cities Lotus User Group (TC-LUG) of Minneapolis and St Paul. It is donated to the public domain and may be freely copied and distributed.

This worksheet has two purposes. One is to provide some useful formulas for financial calculations related to loan amortizations. The second purpose is to be a learning tool providing some basic techniques in spreadsheet development.

If you have questions or comments, please feel free to contact us.

Twin Cities Lotus User Group
5490 Balsam Lane
Plymouth, Mn, 55442

Press PGDN to Continue

When you are looking at Loan Amortization you generally have 4 basic components:

- 1) Original Loan Amount
- 2) Annual Interest Rate

Once the loan is in place and you start to make payments, 2 additional items become of interest:

- 5) Number Of Payments Made
- 6) Remaining Principle Balance

The following screens give short examples of how simple Lotus 1-2-3 formulas can handle Loan Amortization Calculations for the above 6 elements.

All these examples can be performed on a hand-held financial calculator. However, as you will eventually see, they are only scratching the surface in comparison to what a well-designed Lotus 1-2-3 Loan Amortization spreadsheet model can do.

Press PGDN to Continue

You are considering purchasing a new \$100,000 home. The current Annual Interest Rate is 10.000%, and you are looking at a term of 30 years. What is the Monthly Payment Amount for the 360 (30 yrs X 12) Monthly Payments?

Change the Annual Interest Rate to 9.500% and see the affect on your Monthly Payment Amount. Change the Original Loan Amount to \$150,000.00, or the Number of Monthly Payments to 180 (15 yrs X 12).

Original Loan Amount:
Annual Interest Rate:
Number Of Monthly Payments:
Monthly Payment Amount:

NOTE: The Annual Interest Rate must be converted to a monthly rate so the formula can solve for the Monthly Payment Amount. This is done by dividing it by 12. (See formula).

Press PGDN to Continue

You are a Loan Officer in the local bank. A customer comes to you wondering how big of a loan he can get at the current Annual Interest of 10.000% over 30 years (360 months). He informs you that he can make Monthly Payments of \$750.00.

Enter in different figures for Monthly Payment Amount, Annual Interest Rate, and Number Of Monthly Payments to see how it affects the Original Loan Amount.

Monthly Payment Amount:
Annual Interest Rate:
Number Of Monthly Payments:
Original Loan Amount:

NOTE: The Annual Interest Rate must be converted to a monthly rate so the formula can solve using the Monthly Payment Amount. This is done by dividing it by 12. (See formula).

Press PGDN to Continue

You are still employed as a Loan Officer in the local bank. A 2nd customer asks you what the Current Loan Amount will be on his \$100,000 30 year loan at 10.000% after 15 years (180 payments), and after 20 years (240 payments).

You are beginning to get the feel of what a simple Lotus 1-2-3 spreadsheet can do. Formulas recalculate anytime a change is made.

Original Loan Amount:
Annual Interest Rate:
Number Of Monthly Payments:
Number Of Payments Made:
Remaining Principle Balance:

NOTE: The Annual Interest Rate must always be divided by 12 when dealing with monthly payments.

Press PGDN to Continue

The final example looks rather simple, but uses a more advanced method. You are solving for Annual Interest Rate when you provide the Original Loan Amount, Monthly Payment Amount, and the Number Of Monthly Payments. The formulas for Present Value and Annual Interest Rate refer to themselves. Normally this would cause the CIRC indicator to be displayed on the bottom of the screen. Worksheet Recalculation has been changed to Rowwise to prevent this.

To get the formulas to display the correct answer after changing one of the variables, hold down the F9 "CALC" key until the Present Value equals the Original Loan Amount. This may take a few seconds,

Original Loan Amount:

Monthly Payment Amount:

Number Of Monthly Payments:

Present Value:

Annual Interest Rate:

(612) 557-6845
May 1, 1989

Loan Amortization Overview

- 3) Number Of Monthly Payments
- 4) Monthly Payment Amount

Monthly Payment Amount

Sheet1

\$100000.00 (prin)
10.000% (int)
360 (term)
\$877.57 @PMT(prin,int,term)

Original Loan Amount

\$750.00 (pmt)
10.000% (int)
360 (term)
-\$0.03 @PV(pmt,int,term)

Remaining Principle Balance

\$100000.00 (prin)
10.000% (int)
360 (term#1)
180 (pay#)
-\$0.01 (term#1)-(pay#)=(term#2)
@PV(@PMT(prin,int,term#1),int,term#2)

Annual Interest Rate

\$100000.00 <--|
\$877.57 |
360 |
-\$0.02 <--|
10.531% <----

THE END

but when Present
Value equals
Original Loan
Amount, the
Annual Interest
Rate is correct.