

# Calculator and QuickCalc USA

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Is used for compound interest calculations involving uniform payments, and can be used to solve a wide variety of financial, mortgage, and loan problems. Similar to the HP10B and Texas Instrument BAII Plus

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Is used to carryout compounding annual growth calculations.

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## Using Calculator

Calculator offers a variety of programs that help you solve real estate and general financial problems enabling you to make wise financial choices.

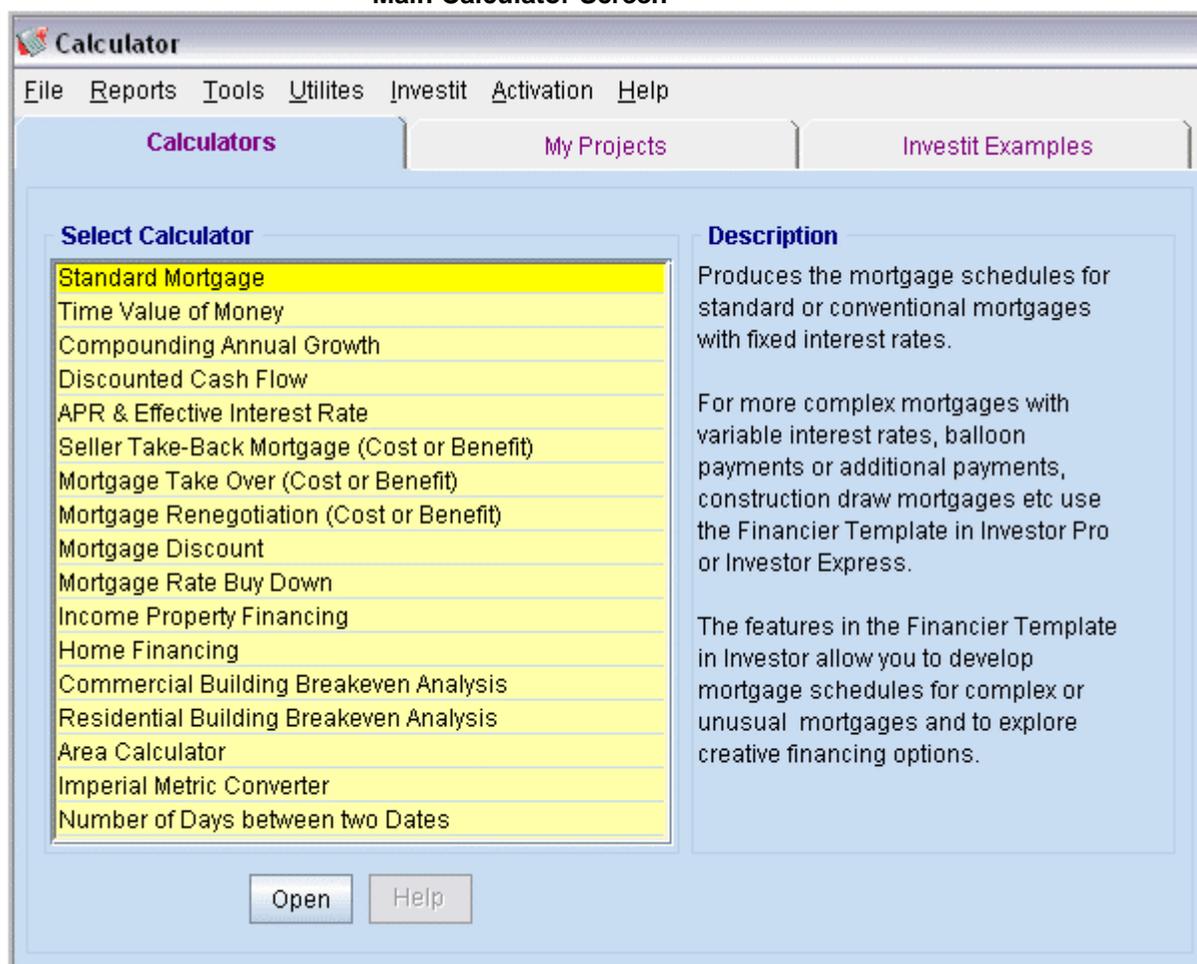
QuickCalc is the same program as Calculator that can be accessed instantly from any Investit Program by clicking on QuickCalc on the menu bar, and then selecting the desired Calculator program.

**Note:** With Calculator, you can save your entries under a Project Name. However, QuickCalc entries and calculations cannot be saved

### Steps for using Calculator

1. Open Calculator, which will display the Main Calculator Screen.
2. Click on New Project to open a new project or click on Open Project to call up a saved project.
3. Click on the desired Calculator Program. E.g., Time Value of Money
4. Enter the required information.
5. Click on the Compute Button to calculate and display the results.
6. To Print Reports, click on the Print Reports button.
7. To display the report on the screen, click on Reports on the menu bar and select the desired report.
8. Click on Done to return to the main Calculator screen.

### Main Calculator Screen



## Time Value of Money Calculator

Is used for compound interest calculations involving uniform payments, and can be used to solve a wide variety of financial, mortgage, and loan problems.

The program can solve for:

- ◆ Present Value (PV)
- ◆ Payment
- ◆ Interest Rate
- ◆ Future Value (FV)
- ◆ Time Period

The following examples show the different types of financial problems that can be solved by the Time Value of Money Calculator.

### Example # 1: Present Value Calculation

How much should I pay for a property which provides a monthly cash flow of \$6,500 at the beginning of each month for 15 years, if I require an Annual Return of 13% compounded monthly? The value of the Property at the end of 15 years is estimated to be \$4,100,000.

Calculate:	Present Value
Nominal Interest Rate:	13%
Future Value:	\$4,100,000
Payment:	\$6,500
Time Period:	15 years
Settings:	
Payment Frequency:	Monthly
Payment made at:	Beginning of Period
Compounding Frequency:	Monthly

Answer: Present Value: \$1,108,774.21

### Example # 2: Future Value Calculation

If I invest \$2,000 per month at the end of each month at 12% per year, compounded monthly. How much will I have at the end of twenty years?

Calculate:	Future Value
Nominal Interest Rate:	12%
Present Value:	\$0.00
Payment:	-\$2,000 (outflow)
Time Period:	20 years
Settings:	
Payment Frequency:	Monthly
Payment made at:	End of Period
Compounding Frequency:	Monthly

Answer: Future Value: \$1,978,510.73

### Example # 3: Nominal Interest Rate Calculation

A lender has loaned \$120,000 and will receive back \$1,200 at the end of each month for 5 years plus \$90,000 at the end of the fifth year.

What is the Annual Return, compounded monthly?

Calculate:	Nominal Annual Interest Rate
Present Value:	-\$120,000 (outflow)
Future Value:	\$90,000 (inflow)
Payment:	\$1,200 (inflow)
Time Period:	5 years
Settings:	
Payment Frequency:	Monthly
Payment made at:	End of Period
Compounding Frequency:	Monthly

Answer:           Nominal Annual Interest Rate: 7.907%

### Example # 4: Time Period Calculations

If you invest \$300,000 at 9.5% compounded monthly plus \$2,000 per month at the beginning of each month, how long will it take for the investment to grow to \$700,000?

Calculate:	Time Period
Nominal Annual Interest Rate:	9.5%
Present Value:	-\$300,000 (outflow)
Future Value:	\$700,000 (inflow)
Payment:	-\$2,000 (outflow)
Settings:	
Payment Frequency:	Monthly
Payment made at:	Beginning of Period
Compounding Frequency:	Monthly

Answer:           Time Period: 68.86 months

### Example # 5: Payment Calculation

An owner of an apartment building feels that he will have to replace all of the appliances in 6 years time at an estimated cost \$39,000. At a Nominal Annual Interest Rate of 4.5%, compounded monthly, how much money will he have to deposit at the beginning of each month in order to have \$39,000 available at the end of 6 years?

Calculate:	Payment
Nominal Annual Interest Rate:	4.5%
Present Value:	\$0.00
Future Value:	\$39,000
Time Period:	6 years
Settings:	
Payment Frequency:	Monthly
Payment made at:	Beginning of Period
Compounding Frequency:	Monthly

Answer:           Payment: \$471.07 per month

#### Notes:

1. **Mortgage Schedules.**

You can use Time Value of Money Calculator to solve mortgage problems, but you may find it easier to use the Standard Mortgage function in Calculator (see below) where you can print out the mortgage schedules.,

2. **Handling uneven cash flows**

If you are dealing with uneven cash flows, use Discounted Cash Flow Calculator (see below), as Time Value of Money Calculator can only handle uniform payments. The following is an example of an "Uneven Cash Flow"

#### Uneven Cash Flow Example

Year 0	-\$350,000
1	\$40,000
2	\$43,000
3	\$49,000
4	\$54,000
5	\$425,000

Time Value of Money Calculator cannot solve this because the periodic payments yearly are uneven. Use the Discounted Cash Flow Calculator.

## Compounding Annual Growth Calculator

Is used to carryout compounding annual growth calculations.

Example: "An Investor has purchased a property for \$600,000, what will it be worth in 15 years time if she thinks the value will increase at 4% per year compounded?"

**Important Note:** The Purchase Price of \$600,000, which is the Present Value, is entered as a negative value because it is an Outflow or payment i.e. the investor is spending \$600,000 which is treated as a negative number. When they sell the property in 15 year time, they receive the money from the sale which is a positive number.

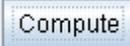
**Compounding Annual Growth**

**Calculate**

Present Value (PV)  
 Future Value (FV)  
 Annual Compounding Rate

**Entries**

Annual Compounding Rate	4.000%
Present Value	-\$ 600,000.00
Future Value	\$ 1,080,566.10
No of Years	15

Enter the above data as show in the picture above and then press the  button.

The program can calculate: Future Value, Present Value, or Annual Compound Growth Rate.

Answer: \$1,080,566

## Discounted Cash Flow Calculator

Is used to calculate the Internal Rate of Return (IRR), the Net Present Value (NPV), and the Modified Rate of Return (MIRR) for a series of cash flows.

Example: An investor is considering purchasing a rental property for \$900,000, and expects the annual cash flows listed below. In addition, he anticipates that the building will sell for \$1,500,000 at the end of the 5th year. What is the:

- ◆ Internal Rate of Return (IRR)?
- ◆ Net Present Value using a 9% Discount Rate?
- ◆ Modified Internal Rate of Return (MIRR) using a short term borrowing rate of 8% and a short term reinvestment rate of 3.5%?

Note: The investment of \$900,000 is entered as a negative number because it is an outflow or payment

Entries	
Number of Periods	<input type="text" value="5"/>
Investor's Discount Rate	<input type="text" value="9.000%"/>
Short Term Financing Rate	<input type="text" value="8.000%"/>
Short Term Reinvestment Rate	<input type="text" value="3.500%"/>

Period	Cash Flow
0	-\$ 900,000
1	\$ 70,000
2	\$ 76,000
3	\$ 78,000
4	\$ 81,000
5	\$ 1,237,000

Results	
Net Present Value (NPV)	<input type="text" value="\$ 149,765.74"/>
Internal Rate of Return (IRR)	<input type="text" value="12.902%"/>
Modified Internal Rate of Return (MIRR)	<input type="text" value="11.757%"/>

Enter the

above data as show in the picture above and then press the  button.

Note: For more complex analysis involving both before and after tax cash flows, use the Investor program.

## Standard Mortgage Calculator

Is used to produce the mortgage schedules for a standard, or conventional mortgage, where the interest rate is fixed for the entire term, and the blended payment of principal and interest is constant. The following results are produced on the screen:

- Principal and Interest components of each payment
- Outstanding balance at the end of the term
- Principal paid-off over the term
- Interest paid over the term
- Effective Annual Interest Rate

Note: For more complex mortgages with multiple terms, fixed or variable interest rates, and additional payments or borrowing, use the Investor Financier Template.

Example: Calculate the payment, Outstanding Balance at the end of the term, and the Effective Interest Rate for the following mortgage:

Mortgage Amount: \$175,000  
 Nominal Annual Interest Rate: 7.500%  
 Amortization Period: 30 years  
 Term: 3 years Mortgage is paid off at the end of 3 years  
 Payment Frequency: Monthly  
 Payment Made: End of Period  
 Compounding Frequency: Monthly

**Standard Mortgage**

**Mortgage Details**

Mortgage Amount:

Nominal Annual Interest Rate:

**Amortization Period**

Years

Months

Weeks

**Term**

Years

Months

Weeks

**Mortgage Settings**

Payment Frequency:

Payment made at:

Payment Rounding:

Compounding Frequency:

Period	Monthly Payments (\$)	Interest (\$)	Principal (\$)	Outstanding Balance (\$)
1	\$ 1,223.63	\$ 1,093.75	\$ 129.88	\$ 174,870.12
2	\$ 1,223.63	\$ 1,092.94	\$ 130.69	\$ 174,739.43
3	\$ 1,223.63	\$ 1,092.13	\$ 131.50	\$ 174,607.93
4	\$ 1,223.63	\$ 1,091.30	\$ 132.33	\$ 174,475.60
5	\$ 1,223.63	\$ 1,090.48	\$ 133.15	\$ 174,342.45
6	\$ 1,223.63	\$ 1,089.65	\$ 133.98	\$ 174,208.47
7	\$ 1,223.63	\$ 1,088.81	\$ 134.82	\$ 174,073.65
8	\$ 1,223.63	\$ 1,087.97	\$ 135.66	\$ 173,937.99
9	\$ 1,223.63	\$ 1,087.12	\$ 136.51	\$ 173,801.48
10	\$ 1,223.63	\$ 1,086.26	\$ 137.37	\$ 173,664.11
11	\$ 1,223.63	\$ 1,085.41	\$ 138.22	\$ 173,525.89
12	\$ 1,223.63	\$ 1,084.54	\$ 139.09	\$ 173,386.80
<b>Total</b>		<b>\$ 44,050.68</b>	<b>\$ 38,825.61</b>	<b>\$ 5,225.07</b>
<b>Effective Annual Interest Rate</b>		<b>7.763%</b>		

Enter the above data as show in the picture above and then press the  button.

## APR/Effective Interest Rate Calculator

Is used to calculate the APR (Annual Percentage Rate) and the Effective Annual Interest Rate. It can be used to compare several different loan proposals by standardizing their Interest Rates.

This allows you to compare mortgages using the “**Effective True Annual Interest Rate**” and choose the best mortgage which is the one with the lowest “Effective True Annual Interest Rate”

Example: A purchaser of a home has been offered the following mortgage. Calculate the:

- Amount advanced to the Borrower
- APR based on Amortization Period
- APR based on Term
- Effective Annual Interest Rate
- Effective True Annual Interest Rate
- Outstanding Balance at the End of Term
- Monthly Payments

Face Value of Loan: \$325,000  
 Nominal Annual Interest Rate: 7.500%  
 Amortization Period: 30 years  
 Term: 5 years. Mortgage is repaid at end of 5 years  
 Loan Fees and Costs  
 Discount Point: 1.50%  
 Origination Fee: \$800  
 Appraisal Fee: \$180  
 Documentation Preparations: \$250  
 Other Closing Costs: \$0

The entries and results are shown on the next page.

Mortgage Details			Mortgage Settings		
Face Value Of Loan	<input type="text" value="325,000.00"/>		Payment Frequency	<input type="text" value="Monthly"/>	
Nominal Annual Interest Rate	<input type="text" value="7.500%"/>		Payment made at	<input type="text" value="End of Period"/>	
<b>Amortization Period</b>		<b>Term</b>		Payment Rounding	<input type="text" value="Up to nearest Cent"/>
<input type="text" value="30"/> Years	<input type="text" value="5"/> Years		Compounding Frequency	<input type="text" value="Monthly"/>	
<input type="text" value="0"/> Months	<input type="text" value="0"/> Months				
<input type="text" value="0.00"/> Weeks	<input type="text" value="0.00"/> Weeks				
<b>Loan Fees and Costs</b>			Amount Advanced to Borrower	<input type="text" value="\$ 318,895.00"/>	
Description	Entry Choice	Amount	APR based on Amortization Period	<input type="text" value="7.695%"/>	
Discount Points	<input type="text" value="1.50%"/>		APR based on Term	<input type="text" value="7.968%"/>	
Origination Fee	<input type="text" value="\$ 800.00"/>		Effective Annual Interest Rate	<input type="text" value="7.763%"/>	
Appraisal Fee	<input type="text" value="\$ 180.00"/>		Effective True Annual Interest Rate	<input type="text" value="8.265%"/>	
Documentation Preparatio...	<input type="text" value="\$ 250.00"/>		Outstanding Balance at End of Term	<input type="text" value="\$ 307,506.46"/>	
Other Closing Costs	<input type="text" value="\$ 0.00"/>		Monthly Payments	<input type="text" value="\$ 2,272.45"/>	

Enter the above data as show in the picture above and then press the  button.

## Mortgage Discount Calculator

Is used to determine how much to pay for a mortgage in order to obtain a specified annual return.

Example: An investor is considering buying the following mortgage.

Nominal Annual Interest Rate	8%
Monthly Payment	\$3,816
Remaining Term	3 Years
Balance at the End of Term	\$460,679

How much should she pay for the mortgage to achieve a return of 11% per year, compounded semi-annually?

Entries;

**Mortgage Discount**

**Details of Mortgage being Purchased**

Monthly Payments

Outstanding Balance at End of Term

**Mortgage Settings**

Payment Frequency

Payment made at

Compounding Frequency

**Remaining Term**

Years  Months  Weeks

**Optional Entries for Report Only**

Current Outstanding Mortgage Balance

Nominal Annual Interest Rate

Desired Nominal Annual Interest Rate

Value of Buyer of the Mortgage

Enter the above data as show in the picture above and then press the  button

Answer;

To achieve a 11% Nominal Annual Interest Rate, the buyer would pay \$ 448,251 for the mortgage.

## Imperial/Metric Converter

Is used to convert between the Imperial and Metric systems for the following types of measures:

- Length
- \$ per area
- Area
- \$ per cubic measure
- Volume (cubic measure)

Example: Convert \$21.00 per Sq. Ft to \$ per Sq. Meter

The screenshot shows the 'Imperial/Metric Converter' interface. It is divided into several sections:

- Method of Measurement:** Contains a 'Type' dropdown menu set to 'Area', a 'Unit of Measure' dropdown menu set to 'Square Feet', and a checked checkbox for '\$ per Unit'. Arrows point to these elements with labels: 'Select' for the Type dropdown, 'Select Unit of Measure' for the Unit of Measure dropdown, and 'Check' for the \$ per Unit checkbox.
- Convert From:** A text input field contains '21,000' followed by '\$ per Sq Foot'. An arrow labeled 'Enter' points to the input field.
- To:** A list of units with checkboxes: '\$ per Sq Inch', '\$ per Sq Foot', '\$ per Sq Yard', '\$ per Mile', '\$ per Acre', '\$ per Sq Centimeter', '\$ per Sq Meter' (checked), and '\$ per Hectare'. An arrow labeled 'Answer' points to the '226.042' value displayed next to the checked '\$ per Sq Meter' option.

## Area Calculator

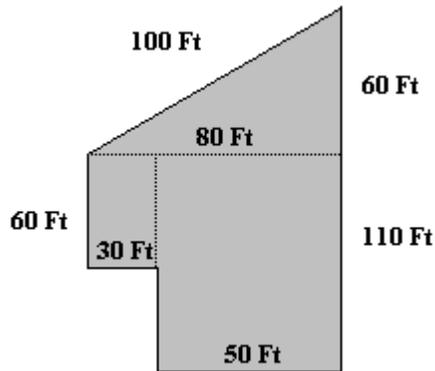
Is used to calculate the area of lots, floor plans etc. consisting of one or more shapes.

The Shape options are:

- Square
- Rectangle
- Triangle
- Circle
- Circle Segment
- Semicircle
- $\frac{1}{4}$  Circle
- $\frac{3}{4}$  Circle
- Circle Sector

You can calculate areas by adding or subtracting the shapes as necessary.

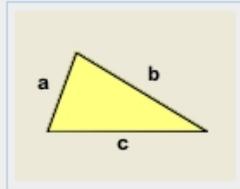
Example: Calculate the area of this building



To calculate the area, carry out the following steps:

1. Select measurement type E.g., Feet, by pointing and clicking on the "Measurement in" Choice Button to display the measurement options, and then click on the desired option.
2. In the first row click on the Shape Choice Button to display the Shape Options and select the Triangle.
3. Enter the dimensions of the Triangle. i.e., 100 feet, 60 feet, 80 feet.
4. Click on the Add Button to add a new Row.
  - a. Select the Rectangle Option in the Shape Box for the row.
  - b. Enter the dimensions of the Rectangle i.e., 50 feet x 110 feet
5. Click on the Add Button to add a new Row.
  - a. Click on the Action Box in the Row to display the Actions and select Add.
  - b. Select the Rectangle Option in the Shape Box for the row.
  - c. Enter the dimensions of the Rectangle i.e., 30 feet x 60 feet
6. Click on the Compute Button to calculate the total area.

### Area Calculator



Measurement in

Action	Shape	Side a	Side b	Side c	Area
add	Triangle	60.00	100.00	80.00	2,400.00
add	Rectangle	50.00	110.00		5,500.00
add	Rectangle	30.00	60.00		1,800.00

→ Total Area in Feet

Answer: Area 9,700 sq. ft.