

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

#### [Area Calculator](#)

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

## 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.

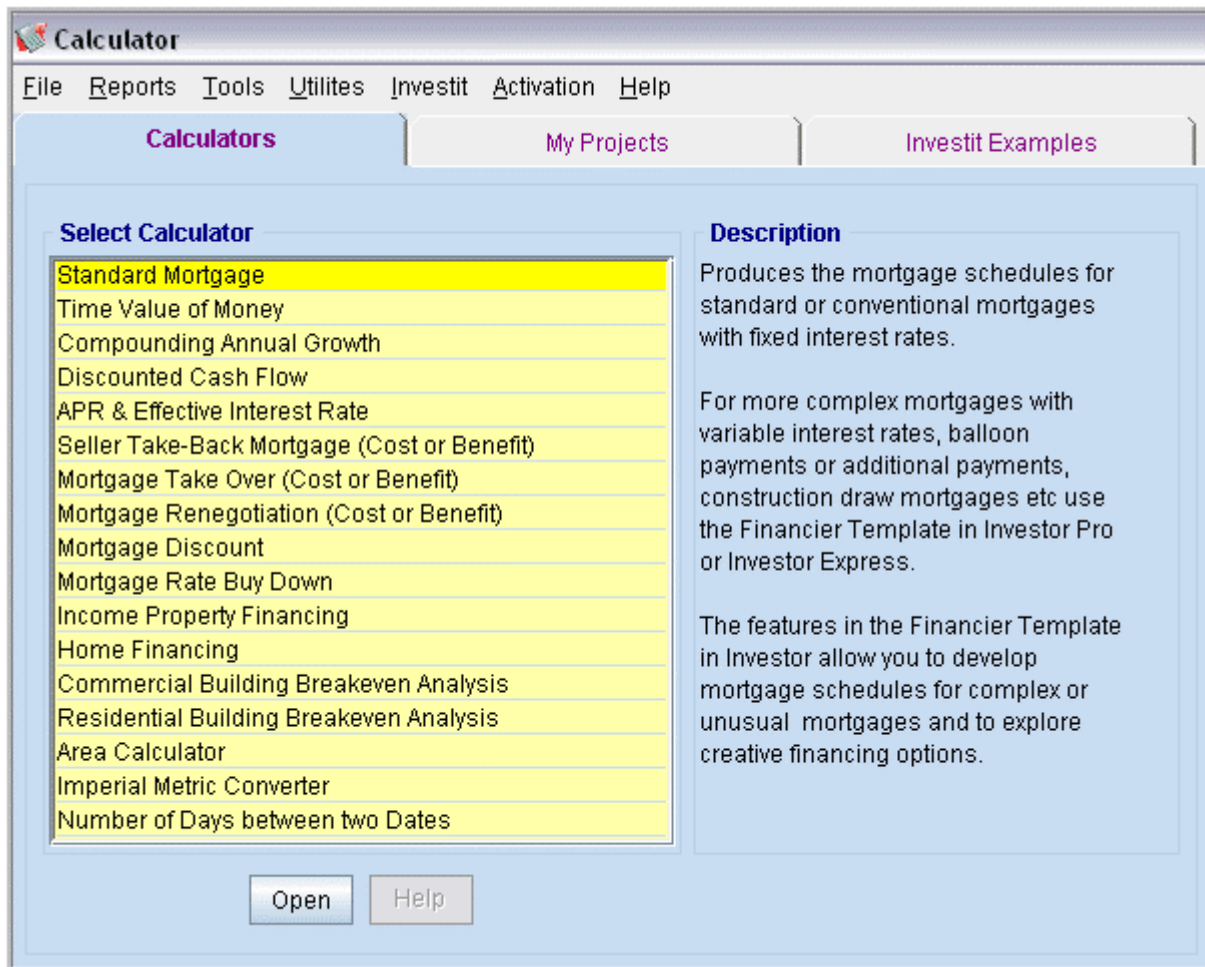
QuickCalc is the same program as Calculator that can be accessed instantly from any Investit Program by clicking on QuickCalc on the menu bar, and then selecting the desired Calculator program.

**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**

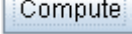
Present Value (PV)

Future Value (FV)

Annual Compounding Rate

**Entries**

Annual Compounding Rate	<input type="text" value="4.000%"/>
Present Value	<input type="text" value="- \$ 600,000.00"/>
Future Value	<input type="text" value="\$ 1,080,566.10"/>
No of Years	<input type="text" value="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

**Total**

Payments:

Interest:

Principal:

Effective Annual Interest Rate:

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.

## Seller Take-Back Mortgage (Cost or Benefit)

Often, the seller of a property provides a mortgage called a "Seller or Vendor Take Back Mortgage" to the buyer of the property. The Interest Rate for the Take Back Mortgage may be different from the current market rate for a similar mortgage. As an example, the Interest Rate for the Take-Back Mortgage is 6.5% and the market rate for a similar mortgage is 7.25%.

This function calculates the Cost or Benefit of the Seller Take Back Mortgage to the buyer of property.

Example: A purchaser of an Income Property has been offered a vendor's first mortgage which has an interest rate of 7.50%, while the market interest rate for a comparable mortgage is 10.00%. The purchaser would like to know the benefit of the vendor's mortgage.

Mortgage Amount:	\$1,000,000
Contract Nominal Annual Interest Rate:	7.500%
Amortization Period:	15 years
Term:	15 years
Current Market Interest Rate:	10.000%

**Seller Take-Back Mortgage (Cost/Benefit)**

**Details of Seller's Mortgage**

Mortgage Amount:

Contract Nominal Annual Interest Rate:

**Amortization Period**

Years  
 Months  
 Weeks

**Term**

Years  
 Months  
 Weeks

**Mortgage Settings**

Payment Frequency:

Payment made at:

Payment Rounding:

Compounding Frequency:

Current Market Interest Rate:

Benefit of Seller's Mortgage:

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

Answer;

The benefit of the Seller's Mortgage at a Nominal Annual Interest Rate of 7.5% when the current market rate for a comparable mortgage is 10% is \$ 137,346.

## Mortgage Take Over (Cost/Benefit)

This function is used to calculate the Cost or Benefit to the purchaser of a property in assuming the Seller's mortgage at an Interest Rate that is either higher, or lower than the current interest rate for a similar mortgage.

Example: What is the cost or benefit to the purchaser for assuming the following mortgage?

Monthly Payment	\$1,144.83
Current Outstanding Balance	\$144,872.84
Remaining Term	3 Years & 7 Months
Outstanding Balance at the End of Term	\$138,203.25
Nominal Annual Interest Rate	8%
Current Interest Rate	6.25%

The screenshot shows a software interface for calculating the cost/benefit of assuming a mortgage. It is titled "Mortgage Take Over (Cost/Benefit)".

- Details of the Mortgage being Assumed:**
  - Monthly Payments: \$1,144.83
  - Current Outstanding Balance: \$144,872.84
  - Outstanding Balance at End of Term: \$138,203.25
- Mortgage Settings:**
  - Payment Frequency: Monthly
  - Payment made at: End of Period
  - Compounding Frequency: Monthly
- Remaining Term:**
  - Years: 3
  - Months: 7
  - Weeks: 0.00
- Optional Entry for Report Only:**
  - Nominal Annual Interest Rate: 8.000%
- Current Market Interest Rate:** 6.250%
- The Cost of assuming the Seller's mortgage is:** \$9,666.48

A "Compute" button is located at the bottom right of the interface.

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

Answer;

The Cost of assuming the Seller's mortgage at a Nominal Annual Interest of 8% when the current market rate for a comparable mortgage is 6.25% is \$9,667.

## Mortgage Renegotiation (Cost/Benefit)

This function is used to evaluate the cost or benefit associated with renegotiating your mortgage if interest rates fall.

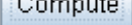
Example: What is the cost or benefit of renegotiating the following mortgage if the interest rate can be reduce from 9.5% to 6.5% by paying a 3 months interest penalty plus legal and other fees of \$ 1,600?

Mortgage Amount	\$350,000
Nominal Annual Interest Rate	9.5%
Amortization Period	30 Years
Time Period since Mortgage Commenced	1 Year & 3 Months
Term	5 Years
<b>Mortgage Settings:</b>	
Payment Frequency:	Monthly
Payment made at:	End of Period
Payment Rounding	Up to the nearest Cent
Compounding Frequency	Monthly
<b>New Mortgage Details:</b>	
Nominal Annual Interest Rate:	6.5%
Refinancing Costs:	\$1,600
Interest Penalty:	3 Months

Entries and results are shown on the next page

### Mortgage Renegotiation (Cost/Benefit)

<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Present Mortgage Details</b> <p>Mortgage Amount <input style="width: 100px;" type="text" value="\$ 350,000.00"/></p> <p>Nominal Annual Interest Rate <input style="width: 100px;" type="text" value="9.500%"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Amortization Period</b> <p>Years <input style="width: 40px;" type="text" value="30"/> Months <input style="width: 40px;" type="text" value="0"/> Weeks <input style="width: 40px;" type="text" value="0.00"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Time Period since Mortgage Commenced</b> <p>Years <input style="width: 40px;" type="text" value="1"/> Months <input style="width: 40px;" type="text" value="3"/> Weeks <input style="width: 40px;" type="text" value="0.00"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Remaining Term</b> <p>Years <input style="width: 40px;" type="text" value="5"/> Months <input style="width: 40px;" type="text" value="0"/> Weeks <input style="width: 40px;" type="text" value="0.00"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <b>Mortgage Settings</b> <p>Payment Frequency <input style="width: 100px;" type="text" value="Monthly"/></p> <p>Payment made at <input style="width: 100px;" type="text" value="End of Period"/></p> <p>Payment Rounding <input style="width: 100px;" type="text" value="Up to nearest Cent"/></p> <p>Compounding Frequency <input style="width: 100px;" type="text" value="Monthly"/></p> </div>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>New Mortgage Details</b> <p>Nominal Annual Interest Rate <input style="width: 100px;" type="text" value="6.500%"/></p> <p>Refinancing Cost (Legal and appraisal fees etc.) <input style="width: 100px;" type="text" value="\$ 1,600.00"/></p> <p>Interest Penalty (Month) <input style="width: 100px;" type="text" value="3"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Refinancing Costs</b> <p>Refinancing Costs <input style="width: 100px;" type="text" value="\$ 1,600.00"/></p> <p>Interest Penalty <input style="width: 100px;" type="text" value="\$ 8,247.65"/></p> <p style="text-align: right;">Total <input style="width: 100px;" type="text" value="\$ 9,847.65"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <b>Present Mortgage</b> <p>Current Outstanding Balance <input style="width: 100px;" type="text" value="\$ 347,269.52"/></p> <p>Outstanding Balance at End of Term <input style="width: 100px;" type="text" value="\$ 336,843.40"/></p> <p>Monthly Payment <input style="width: 100px;" type="text" value="\$ 2,942.99"/></p> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <b>New Mortgage</b> <p>Mortgage Amount <input style="width: 100px;" type="text" value="\$ 347,269.52"/></p> <p>Outstanding Balance at End of Term <input style="width: 100px;" type="text" value="\$ 329,727.11"/></p> <p>Monthly Payment <input style="width: 100px;" type="text" value="\$ 2,226.34"/></p> </div>
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Enter the above data as show in the picture above and then press the  button.

Answer;

The present value of the money saved by accepting the new mortgage is \$ 24,284.32 when discounted at 6.5%.

Consider accepting the new mortgage.

If the answer was negative consider rejecting the new mortgage

When deciding whether to renegotiate a mortgage to lower the interest cost you need to establish the total costs and fees that the lender will charge for redoing the mortgage.

The lender will calculate the interest Rate Differential Cost between the contract interest rate and the proposed interest rate which will be paid by the borrower if the loan is renegotiable. In addition there may be other fees and costs charged.

## Home Financing Calculator

Is used to calculate the loan amount and mortgage payment using the family income and expenses, as well as the:

- Loan to Value Ratio
- Front End Ratio (Housing Ratio)
- Back End Ratio (Total Debt Ratio)

Example: A family would like to know how much they can borrow for a first mortgage on a home they are planning to purchase. The appraised value of the home is \$435,000.

### Home Financing

#### Family Income and Expenses

##### Monthly Income

Income Description	Amount
Combined Monthly Income	→ \$ 8,000
Other Monthly Income	→ \$ 200
<b>Gross Monthly Income</b>	<b>\$ 8,200</b>

##### Housing Expenses

Description	Entry	Amount
Property Taxes	Annual	→ \$ 1,700
Insurance	Annual	→ \$ 800
Condominium Association dues	Monthly	\$ 0
Other Housing Expenses	Monthly	\$ 0
<b>Total Monthly Housing Expenses</b>		<b>\$ 208</b>

##### Other Monthly Expenses

Expense Description	Amount
Car Loan or Lease Payments	→ \$ 450
Credit Card Payments	→ \$ 100
Bank Loan Payments	\$ 0
Alimony/Child Support Payments	\$ 0
Other Monthly Payments	\$ 0
<b>Total Monthly Expenses</b>	<b>\$ 758</b>
<b>Net Monthly Income</b>	<b>\$ 7,442</b>

#### Mortgage Details

Nominal Annual Interest Rate → 7.500%

##### Amortization Period

Years Months Weeks

→ 30 0 0.00

#### Mortgage Settings

Payment Frequency Monthly

Payment made at End of Period

Payment Rounding Up to nearest Cent

Compounding Frequency Monthly

#### Lending Criteria

Appraised Value (for lending purposes) → \$ 435,000

Loan/Value Ratio → 75.00%

Front End Ratio (Housing Ratio) → 30.00%

Back End Ratio (Total Debt Ratio) → 38.00%

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

Answer;

Loan amount based on a Loan/Value Ratio of 75% is \$ 326,250 with monthly payments of \$ 2,281.19 with an equity requirement of \$ 108,750 (25%).

Loan amount based on a Front End Ratio (Housing Ratio) of 30% is \$ 322,076 with monthly payments of \$ 2,252 with an equity requirement of \$ 112,924 (26%).

Loan amount based on a Back End Ratio (Total Debt Ratio) of 38% is \$ 337,236 with monthly payments of \$ 2,358 with an equity requirement of \$ 97,764 (22%).

Conclusion:

Based on the lending criteria entered, the loan amount based on a Front End Ratio (Housing Ratio) of 30% is \$ 322,076, with monthly payments of \$ 2,252 with an equity requirement of \$ 112,924 (26%).

Note: There are a variety of ways to calculate the Front End or Housing Ratio.

The program uses the following formula:

$$\text{Housing Ratio} = \frac{\text{Principal Interest} + \text{Housing Expenses}}{\text{Gross Monthly Income}}$$

## Income Property Financing Calculator

Example: Calculate the loan amount for a rental apartment building based on the following information:

Income Property Financing	
<b>Income and Bad Debt Allowance</b>	
Annual Potential Gross Income	→ \$ 950,000
Less: Vacancy and Bad Dept Allowance	→ 3.50%
Effective Gross Income	\$ 916,750
<b>Operating Expenses</b>	
Annual Operation Expenses	
% of Effective Gros...	→ 20.00%
Property Management	
% of Effective Gros...	→ 5.00%
Total Operation Expenses	\$ 229,188
Net Operating Income	\$ 687,562
<b>Market Value Entry Option</b>	
Cap Rate	→ 9.50%
Appraised Value	\$ 7,237,495
<b>Mortgage Details</b>	
Nominal Annual Interest Rate	→ 7.500%
<b>Amortization Period</b>	
Years	→ 15
Months	0
Weeks	0.00
<b>Mortgage Settings</b>	
Payment Frequency	Monthly
Payment made at	End of Period
Payment Rounding	Up to nearest Cent
Compounding Frequency	Monthly
Loan/Value Ratio	→ 75.00%
Debt Service Ratio	→ 1.20
<b>Based on Loan Value Ratio</b>	
Payment	\$ 50,319.36
Loan Amount	\$ 5,428,121.00
<b>Based on Debt Service Ratio</b>	
Payment	\$ 47,747.37
Loan Amount	\$ 5,150,671.47

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

Answer;

The loan amount is \$ 5,428,121 based on a Loan to Value Ratio of 75% with monthly payments of \$ 50,319.36 with an equity requirement of \$ 1,809,374 (25%) based on capitalized value.

The loan amount is \$ 5,150,671 based on a Debt Service Ratio of 1.2 with monthly payments of \$ 47,747.37 with an equity requirement of \$ 2,086,824 (29%) based on capitalized value.

Conclusion:

Based on the entered lending criteria, the loan amount is \$ 5,150,671 based on a Debt Service Ratio of 1.2 with monthly payments of \$ 47,747.37 with an equity requirement of \$ 2,086,824 (29%) based on capitalized value.

### Mortgage Rate Buy Down Calculator

In marketing new developments, such as a condominium project, the developer may offer the purchaser a first mortgage with an Interest Rate that is less than the current Market Interest Rate. He does this by buying down the interest rate from the lender.

This function calculates the Buy Down Mortgage Contract between the Lender and the Developer.

Example: A condominium developer wishes to offer a mortgage to the buyers of the units with an interest rate lower than the market interest rate. He does this in an attempt to make the project more marketable. Calculate the mortgage contract between the Lender and the Developer.

The financial information is:

**Mortgage Details**

Loan Amount

Nomina Annual Interest Rate

Amortization (in Years)

Term (in Years)

**Mortgage Settings**

Payment Frequency

Payment made at

Compounding Frequency

**Buy Down Details**

Number of Buy Down Stages

Stage	Interest Rate Reduction (%)	Number of Years	Periodic Payment
1	3.00%	1	\$ 0.00
2	2.00%	1	\$ 1,143.92
3	1.00%	1	\$ 1,219.56
	0.00%	2	\$ 1,297.82

Terms (in years)

Buy Down Fee paid by

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

Answer;

Buy Down Fee	<input type="text" value="\$ 5,037.30"/>	Conventional Monthly Payment	<input type="text" value="\$ 1,297.82"/>
Effective Annual Interest Rate for Borrower	<input type="text" value="6.756%"/>	Outstanding Balance at End of Term	<input type="text" value="\$ 109,334.09"/>

## Residential Building. Breakeven Analysis

This function is used to calculate the number of suites that must be rented in order for an apartment building to breakeven, which occurs when the income exactly covers the operating expenses and mortgage payments.

Example: An investor is considering purchasing a 45 suite rental apartment building and wants to know how many suites must be rented in order to breakeven.

Number of Suites	45
Income Per Suite Per Month	\$680
Annual Fixed Operating Expenses	\$78,000
Annual Variable Cost Per Suite	\$480
Annual Debt Service (Mortgage Payments)	\$198,000

Number of Suites	<input type="text" value="45"/>
Average Income per Suite per Month (including parking)	<input type="text" value="\$ 680.00"/>
Annual Fixed Operating Expenses	<input type="text" value="\$ 78,000"/>
Annual Variable Operating Cost per Suite	<input type="text" value="\$ 480"/>
Annual Debt Service	<input type="text" value="\$ 198,000"/>

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

Answer;

This building will breakeven when 36 (80%) of the suites are rented.

## Commercial Building. Breakeven Analysis

This function is used to calculate the amount of space (in square feet) that must be rented in order for the building to breakeven, which occurs when the income exactly covers the operating expenses and mortgage payments.

Example: An investor is considering purchasing a 75,800 square foot office building and wants to know how many square feet must be rented in order to breakeven.

Rentable Area	75,800 Sq Feet
Average Income Per Sq Feet Per Year	\$23.50
Annual Fixed Operating Expenses	\$76,000
Annual Variable Cost Per Sq Foot	\$1.25
Annual Debt Service (Mortgage Payments)	\$958,000

Rented Area (Sq Feet)	<input type="text" value="75,800"/>
Average Income/Sq Ft/Year (including parking)	<input type="text" value="\$ 23.50"/>
Annual Fixed Operating Expenses	<input type="text" value="\$ 76,000"/>
Annual Variable Operating Cost per Sq Foot	<input type="text" value="\$ 1.25"/>
Annual Debt Service	<input type="text" value="\$ 958,000"/>

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

Answer

This building will breakeven when 46,472 (61.31%) square feet is rented.

## 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 a web-based "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".
- 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 target 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".

Annotations with arrows indicate the following actions:

- "Select" points to the "Type" dropdown menu.
- "Select Unit of Measure" points to the "Unit of Measure" dropdown menu.
- "Check" points to the "\$ per Unit" checkbox.
- "Answer" points to the "226.042" value in the "To" section.

## Area Calculator

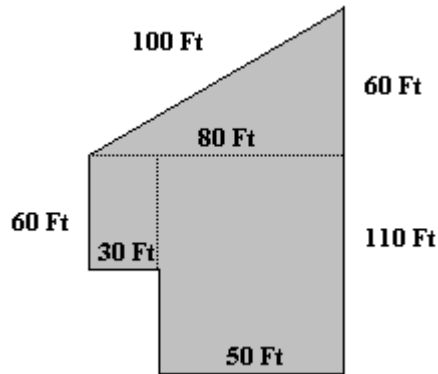
Is used to calculate the area of lots, floor plans etc. consisting of one or more shapes.

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.

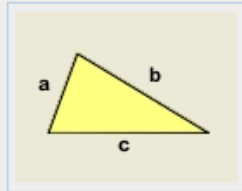
Example: Calculate the area of this building



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.