Financial Calculating for Home and Business

A Demonstration Guide to Understanding the Basic Concept, Elements, and Applications of Financial Calculating as an Essential Means to Figuring and Assessing Financial Outcomes

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What Can Financial Calculating Do for You?

In order to make wise and informed financial decisions, one must be able to both determine and assess financial outcomes. A financial calculator is an invaluable tool for figuring, estimating, comparing, and assessing financial outcomes. It is also easy to use, inexpensive, and portable. Used at the morning breakfast table, in the marketplace, or at the office, this tool can provide information that will foster better decision-making and planning, while preventing serious errors based on faulty estimates or assumptions. It can help anyone do the following:

1. Determine the profit margin and mark-up on various business products and services.
2. Determine the payment for installment loans with various interest rates and time periods.
3. Determine how much one can borrow with various payments, interest rates, and time periods.
4. Determine how much interest would be paid with any one payment during the life of a loan.
5. Determine the principal balance remaining after any given payment on an installment loan.
6. Determine the best deal for financing something when choosing among various interest rates, time periods, and other terms such as discounts, rebates, and interest-free periods.
7. Determine the impact of different down payments on the monthly payment and total interest.
8. Determine the impact of increasing one’s monthly payment on the time it would take to pay off a debt and free the income that had been going towards that payment for other uses.
9. Determine the impact of consolidating debts under a consolidation loan or home equity loan on the size of the monthly payment, the period of repayment, and the total interest paid.
10. Determine how long it would take to pay off or pay down a set of revolving charge accounts.
11. Determine the rate of appreciation any asset has experienced over a given period of time.
12. Estimate cost and price increases associated with various inflation rates and time periods.
13. Compare the return on capital expected from one type of investment with that from another.
14. Determine the contributions to savings that would be needed to replace a piece of equipment.
15. Determine how long a monthly or annual payment invested at certain rates and periods of time would be required to achieve a particular savings, investment, or retirement goal.
16. Determine how much income could be received monthly or annually from a savings fund, retirement account, annuity, or asset conversion for given interest rates and time periods.

These and many other financial problems, comparisons and outcomes can be figured, compared, explored, assessed, and evaluated with the aid of a financial calculator. Fortunately, there are only four patterns of financial calculating encompassing the majority of situations that need to be learned. Thus, it is easy to learn, master, and apply the methods and results of financial calculating in your life.
Getting Started

The financial world of today is far more complex than ever before. Entrepreneurs and consumer would be at a grave disadvantage without an easy and effective way to figure and assess the many financial outcomes and opportunities facing them. This disadvantage, however, can be overcome with the aid of a financial calculator. Below are the keys used in financial calculating using the Texas Instruments BA-35 Solar Calculator for demonstration purposes.

Learning the Operational Keys

The operational keys assist in using the other keys. They control turning the calculator on, setting the mode, fixing the decimal point, computing values, and clearing the display and memory.

| CMR |
| CE/C |

| Fix |
| 2nd |
| CPT |
| MODE |
| AC/ON | → |

| AC/ON |
| TURNS calculator on. Clears calculator completely, including memory, mode, and decimal setting. Calculator shuts off when no longer exposed to light. |

| MODE |
| ROTATES mode from Financial (FIN) to Statistical (STAT) to Business (blank). Check display window to see in which mode the calculator is operating. |

| 2nd |
| ACTIVATES second or alternate functions printed above some keys. Press 2nd key then key with desired function printed above it. Repeat sequence to turn it off. |

| Fix |
| CPT |
| FIX is activated as alternate function of CPT key. It puts decimal at desired place. To set decimal at 2 places, press 2nd key, then Fix key, then number 2. |

| → |
| CLEARS last numerical entry or decimal without clearing entire display. But to change values entered at financial keys, enter desired value over previous one. |

| CMR |
| CE/C |
| CE/C key clears incorrect entries, error conditions, or pending operations. CMR key clears memory. Press 2nd, CMR, CMR to clear memory and display. |

| CPT |
| COMPUTES answer to problem by revealing value of next key pressed. For example, pressing CPT key then PV key computes the value at the PV key. |
Getting Down to Business

Learning the Profit-Margin Keys

The profit-margin keys become operational when the mode displayed is blank with neither the FIN of the financial mode or the STAT of the statistical mode appearing on the display. To change to the profit-margin mode, press the MODE key until the mode display is blank.

**MU**

| % | CST | SEL | MAR |

**CST**  
Refers to the cost of goods. To enter a specific cost, use the numeric keys to display the amount of the cost, then press the CST key.

**SEL**  
Refers to the selling price of goods. To enter a specific selling price, use the numeric keys to display the amount of the selling price, then press the SEL key.

**MAR**  
Refers to the gross profit margin, which is the difference between the selling price and cost expressed as a percentage of the selling price. To compute the margin for a given cost and selling price, press the CPT key then the MAR key.

**MU**  
Refers to the markup, which is the difference between the selling price and cost of goods expressed as a percentage of the cost. To compute the markup for a given cost and selling price, press the CPT key, the 2nd key, then the MU key.

Markup versus Profit Margin

What is the difference between a markup and a profit margin? Both involve the difference between cost and selling price and both are expressed as percentages. However, when the difference between cost and selling price is figured as a percentage of the cost, it is a markup. When the difference between cost and selling price is figured as a percentage of the selling price, it is a profit margin. Consider a product that costs $1 to make and sells for $4. The difference is $3.

\[
\begin{array}{c|c|c}
\text{Cost} & \text{Difference} & \text{ Markup} = \frac{\text{Difference}}{\text{Cost}} \times 100 = \frac{3}{1} \times 100 = 300\% \\
\text{Sale Price} & & \text{Margin} = \frac{\text{Difference}}{\text{Sale Price}} \times 100 = \frac{3}{4} \times 100 = 75\% \\
\end{array}
\]
Calculating Markups and Profit Margins

Michael and Martha produce stained glass ornaments for sale through art fairs and consignment stores. The typical ornament costs $10 to make and sells for $25. What is the markup on their typical ornament? What is the profit margin on their typical ornament?

Mathematical Method

1. The difference between the selling price and cost equals selling price (25) minus cost (10), or 15.
2. The markup equals the difference (15) divided by the cost (10) times 100, or 150%
3. The profit margin equals the difference (15) divided by the selling price (25) times 100, or 60%

Calculator Method

1. Make sure the calculator has been cleared and placed in the profit-margin mode (blank mode).
2. To find markup, enter cost (10, CST), enter selling price (25, SEL), then press CPT, 2nd, MU.
3. To find profit margin, enter cost and selling price as above and then press CPT, MAR.
Note: Answers are the same as those for above computations. Also note: Once the cost and selling price have been entered, they need not be re-entered for a second computation involving the same cost and selling price.

Additional problems:
1. Tracy has a product that costs $4.57 to produce. How much should she sell it for if she wants a markup of 300%? Hint: To enter the markup press 300, 2nd, MU. Ans. $18.28.
2. Gordon’s product sells for $15. His profit margin is 75%. What is his cost? Ans. $3.75.

Calculating Percentage Discounts and Add-ons

Percentage discounts and add-ons can be calculated easily using the % key. To calculate the price of a product after an X% discount, enter the price of the product, then press the minus (-) key, X, the % key, and equals (=) key. For example, Jake is selling a product through Amazon.com, which requires a 55% discount from Jake. If Jake’s product sells for $19.95 at Amazon.com, how much will he receive from Amazon.com for each product sold? To find, the discounted price, press $19.95, then the minus (-) key, 55, the % key, and the equals (=) key. Ans.: $8.98.

Percentage add-ons are figured similarly except the plus (+) key is used instead of the (-) key. If Megan wanted to sell a product that cost her $5.00 to buy at wholesale with a 250% add-on at retail, she would press 5, (+) key, 250, % key, and equals (=) key. Ans.: $17.50.
Four Basic Patterns of Financial Calculating

Growth: Present Value Grows to Future Value
Capital Appreciation
Growth of Savings
Inflationary Impacts

\[ \text{PV} \implies \text{FV} \]

Borrowing: Payments Repay a Present Value
Business Development Loans
Equipment Purchase Loans
Personal Installment Loans

\[ \text{PV} \Longleftrightarrow \text{PMT} \text{ PMT} \text{ PMT} \]

Accumulation: Payments Grow to Future Value
Savings Accumulation Fund
Individual Retirement Account
Investment Contribution Plan

\[ \text{PMT} \text{ PMT} \text{ PMT} \implies \text{FV} \]

Disbursement: Present Value Generates Payments
Disbursements from a Savings Fund
Payments from a Retirement Account
Distributions from Available Capital

\[ \text{PV} \implies \text{PMT} \text{ PMT} \text{ PMT} \]
Learning the Financial Keys

| N | %i | PV | PMT | FV |

N

Refers to the total number of financial periods in the calculation. 
For instance, pressing 12, then N enters 12 as the value of N.
Examples: Number of compounding periods.
   Number of installment payments or loan periods.
   Number of payments to or from an account.

%i

Refers to the interest rate applied each financial period in the calculation.
For instance, pressing 6 then %i enters a 6% annual percentage rate.
Examples: Interest rate per year for annual payments or compounding.
   Interest rate per day for accounts compounded daily.
   Interest rate per month for loans or distributions paid monthly.

PV

Refers to the present value, which is the initial or starting value of a sum.
For instance, pressing 10,000 then PV enters a present value of $10,000.
Examples: Lump sum amount deposited in savings or investment account.
   Principal amount borrowed as business, auto, or personal loan.
   Accumulated amount generating disbursement of payments.
   Initial value of goods, stocks, a home, or other capital asset.

PMT

Refers to the periodic payments made to or from an account.
For instance, pressing 200 then PMT enters a payment value of $200.
Examples: Payments made to repay an installment loan or mortgage.
   Payments made to accumulate savings or capital for investing.
   Payments disbursed regularly from savings or retirement funds.

FV

Refers to future value, which is the end or appreciated value of a sum.
For instance, pressing 500,000 then FV enters a future value of $500,000.
Examples: Appreciated value of a savings deposit or amount invested.
   Accumulated value of set aside or retirement fund contributions.
   Appreciated value of goods, stocks, a home, or other capital asset.
Calculating Growth
Capital Appreciation
Growth of Savings
Inflationary Growth

\[
\begin{array}{c|c|c|c|c}
PV & \Rightarrow & FV \\
\end{array}
\]

Jackie invests $10,000 in a Certificate of Deposit that offers 6% APR for a two-year term.
1. How much will she receive at the end of two years if interest is compounded annually?
2. How much will she receive at the end of two years if interest is compounded quarterly?

Steps to solve:
Write down the known values under keys where they are to be entered.
Put a question mark under key to be computed and a dash under the key that will not be used.
Enter each value by pressing the number to be entered, then the key where it is to be entered.
Compute the unknown value by pressing the compute (CPT) key and then key of unknown value.

Problem 1. Annual compounding.

\[
\begin{array}{c|c|c|c|c|c|c}
N & \%i & PV & PMT & FV \\
2 & 6 & 10,000 & -- & ? \\
\end{array}
\]
Press CPT, FV
FV = $11,236.00

Problem 2. Quarterly compounding.

\[
\begin{array}{c|c|c|c|c|c|c}
N & \%i & PV & PMT & FV \\
2 \times 4 = & 6 \div 4 = & 10,000 & -- & ? \\
\end{array}
\]
Press CPT, FV
FV = $11,264.93

If you did not get the answers to these problems do the following: (1) check to make sure FIN is displayed; (2) clear calculator by pressing 2^{nd},CMR, CMR; (3) stroke keys evenly and try again.

Additional problems:
1. What interest rate compounded annually would triple $10,000 in 15 years? Ans.: 7.60%.
2. What was the average rate of annual appreciation on a business now worth $500,000 that was started 10 years ago for $45,000? Hint: $45,000 is the PV, $500,000 is the FV. Ans.: 27.23%.
Calculating Loans
Business Development Loans
Equipment Purchase Loans
Personal Installment Loans

Ralph wants to purchase a new piece of machinery but he needs a loan of $8,000 to do so.
1. What will be Ralph’s monthly payment if he takes a loan for 5 years at 8% APR?
2. What will be Ralph’s monthly payment if he takes a loan for 4 years at 7% APR?

Steps to solve:
Write down the known values under keys where they are to be entered.
Put a question mark under key to be computed and a dash under the key that will not be used.
Enter each value by pressing the number to be entered, then the key where it is to be entered.
Compute the unknown value by pressing the compute (CPT) key and then key of unknown value.

Problem 1. A 5-year loan at 8% APR

\[
\begin{align*}
N &= 5 \times 12 = 60 \\
\% i &= 8 \div 12 = 0.66667 \\
PV &= 8,000 \\
PMT &= ? \\
FV &= --
\end{align*}
\]
Press CPT, PMT
PMT = $162.21

Problem 2. A 4-year loan at 7% APR

\[
\begin{align*}
N &= 4 \times 12 = 48 \\
\% i &= 7 \div 12 = 0.58333 \\
PV &= 8,000 \\
PMT &= ? \\
FV &= --
\end{align*}
\]
Press CPT, PMT
PMT = $191.57

Additional problems:
1. How much could Ralph borrow for 5 years at 12% if his monthly payment was $170?
   Ans.: $7,642.36.
2. How much could Ralph borrow for 5 years at 18% if his monthly payment was $200?
   Ans.: $7,876.05.
Calculating Loan Balances

First enter the data regarding your loan and solve for any one value. Then enter the number of the last payment you made and press the BAL key to find the remaining loan balance. John has just made the 18th payment on a 5-year car loan for $20,000 financed at 9% APR. He wants to know what his remaining balance is after the 18th payment?

\[ N \quad %i \quad PV \quad PMT \quad FV \]

\[ 5 \times 12 = \quad 9 \div 12 = \quad 20,000 \quad ? \quad -- \]

Press CPT, PMT
PMT = $415.17

\[ x \leftrightarrow y \quad I/P \quad BAL \quad P_1/P_2 \]

18 BAL
BAL = $14,910.19

Calculating Interest and Principal

First enter the facts regarding the loan and compute any one of the values. To find the interest and principal paid over a series of payments, enter the number of the 1st payment in the series and press \( P_1/P_2 \) key. Then enter the number of last payment in the series and press I/P key to reveal interest paid. Then press the \( x \leftrightarrow y \) key to reveal the principal paid. With respect to John’s car loan above, the interest and principal paid with payments 13-24 would be found as follows:

\[ N \quad %i \quad PV \quad PMT \quad FV \]

\[ 5 \times 12 = \quad 9 \div 12 = \quad 20,000 \quad ? \quad -- \]

Press CPT, PMT
PMT = $415.17

\[ x \leftrightarrow y \quad I/P \quad BAL \quad P_1/P_2 \]

Step 1. .................................................. 13, \( P_1/P_2 \)
Step 2. ......................................... 24, I/P
\[ I = $1,354.28 \]
Step 3. ........... \( x \leftrightarrow y \)
\[ P = $3,627.72 \]
Calculating Accumulations
Savings Accumulation Fund
Individual Retirement Account
Investment Contribution Plan

\[
\text{PMT} \quad \text{PMT} \quad \text{PMT} \quad \Rightarrow \quad \text{FV}
\]

Rachel just began saving $400 every month in an account paying 7% APR.
1. How much will she have in the account at the end of 5 years?
2. How much will she have in 40 years if she saves $2000 per year at 9% APR?

Steps to solve:
Write down the known values under keys where they are to be entered.
Put a question mark under key to be computed and a dash under the key that will not be used.
Enter each value by pressing the number to be entered, then the key where it is to be entered.
Compute the unknown value by pressing the compute (CPT) key and then key of unknown value.
Special Note: Press +/- key after displaying payment amount and before pressing PMT key for calculations involving payments into a savings or annuity type fund. Only payments into these funds are marked minus.

Problem 1. $400 per month for 5-years at 7% APR. Press +/- key before entering payment.

\[
\begin{align*}
N & \quad \%i \quad PV \quad PMT \quad FV \\
5 \times 12 & = & 7 \div 12 & = & -- & (\cdot) 400 & ? \\
& & & & & \text{Press CPT, FV} & \\
& & & & & FV = $28,637.16 \\
\end{align*}
\]

Problem 2. $2000 per year for 40 years at 9% APR. Press +/- key before entering payment.

\[
\begin{align*}
N & \quad \%i \quad PV \quad PMT \quad FV \\
40 & & 9 & -- & (\cdot) 2000 & ? \\
& & & & & \text{Press CPT, FV} & \\
& & & & & FV = $675,764.89 \\
\end{align*}
\]

Additional problems:
1. To accumulate $100,000 in 20 years at 8% APR, the annual payment would be ________.
2. To accumulate $1 million in 40 years at 9%, the monthly payment would be ________.
Note: Assume like payment and compounding frequencies (e.g., yearly/yearly, monthly/monthly).
Answers on page 13. Payments are assumed to be positive amounts as the answers to problems.
Calculating Disbursements
Disbursements from a Savings Fund
Payments from a Retirement Account
Distributions from Available Capital

After paying her business startup costs, Lynette has $60,000 left to pay her monthly expenses.
1. How much can she withdraw monthly for one year if her bank pays 2\% on savings?
2. How much can she withdraw monthly for two years if her bank pays 3\% on savings?

Steps to solve:
Write down the known values under keys where they are to be entered.
Put a question mark under key to be computed and a dash under the key that will not be used.
Enter each value by pressing the number to be entered, then the key where it is to be entered.
Compute the unknown value by pressing the compute (CPT) key and then key of unknown value.
Special Note: 2^{nd} and BGN keys are pressed before starting problem in order to compute beginning of period payments. Payments made from an account are usually considered to be made at the beginning of the period.
When “Begin” is displayed, beginning of period payments will be computed. To turn off, repeat 2^{nd}, BGN.

Problem 1. Monthly payments for 1 year, account paying 2\% APR. Press 2^{nd}, BGN keys at the start.

\[
\begin{array}{cccc}
N & \%i & PV & PMT & FV \\
1 \times 12 = & 2 \div 12 = & $60,000 & ? & -- \\
\end{array}
\]
Press CPT, PMT
PMT = $5,045.92

Problem 2. Monthly payments for 2 years, account paying 3\% APR. Check display for “Begin.”

\[
\begin{array}{cccc}
N & \%i & PV & PMT & FV \\
2 \times 12 = & 3 \div 12 = & $60,000 & ? & -- \\
\end{array}
\]
Press CPT, PMT
PMT = $2,572.44

Additional problems:
1. How much money would Marilyn need to have in retirement funds invested at 6\% APR in order to be able to receive payments of $2,600 per month for 25 years?
2. How much money would Marilyn need for payments of $3,000 per month?
Note: If payments are monthly, years and interest rate must reflect monthly frequency. Answers on page 13.
Calculating Tips and Notes

Calculating tips.
- Set up any problem on paper before making your entries. It is easy to forget what specific numbers were entered in arriving at an answer.
- To make an entry, press the numerical amount first and then the key where it is to be entered. Press the number 7 and then N to enter 7N.
- Press the keys firmly and directly with the pad of one finger, not with a pencil tip or fingernail, to ensure good contact and proper entry.
- To clear your calculator memory and display, press the 2nd key, CMR, CMR before starting a new type of problem. CMR is above CE/C key.
- Do not clear the calculator if you want to solve variations of the same type of problem. Enter new values over old and re-compute the answer.
- Interest rates entered under the %i key are automatically converted to decimal equivalents. Enter 7 not .07 at %i key to enter a 7% APR.
- Press the equals key (=) to complete mathematical operations before entering the result. Pressing the equals key completes the operation.
- Accounting practice regards regular payments into a fund as negative. Before entering a payment sum press the +/- key to show a minus sum.
- Accounting practice regards regular payments from a fund as positive. You do not need to change these amounts to minus with the +/- key.
- Note that when computing interest rates for monthly payments, the answer displayed is the monthly rate. Multiply by 12 for annual rate.
- Realize that “error” can appear on the screen for a variety of reasons, such as the problem has no answer as entered, you did not properly clear the calculator, or you used an incorrect combination of keys.
- When confused, in doubt, or “error” appears, clear your calculator and start over. Set up any problem on paper before making entries.
- If you can’t get the answer to a particular problem, clear your calculator fully and start again. Use a similar practice problem to guide you.

Other calculators. These instructions can be adapted for using other financial calculators. Just be sure to read the instruction booklet that comes with the make and model selected. Take special note of any differences regarding clearing the calculator and making entries. The primary keys and functions should be the same even if there are slight differences in order or placement.

Dissimilar periods. To solve problems having different compounding and payment periods (e.g., one is daily and the other monthly) do as follows: Enter the compounding period under N key, the interest rate per payment period under %i key, and number 1 under PV key. Solve for FV. Without clearing, enter the number of payments per year under N key and solve for %i. Without clearing, make the entries for your two known values and solve for the unknown value. For all but the most exacting requirements, use identical compounding and payment periods.

Answers to additional problems.
Page 11: (1) $2,185.22 and (2) $213.61.
Page 12: (1) $405,555.54 and (2) $467,948.69.
Financial Calculating Solutions

- Markups & Margins
- Discounts & Add-ons
- Capital Appreciation
- Inflationary Impacts
- Loans and Mortgages
- Accumulation Funds
- Disbursement Funds

Learning the Operational Keys

CPT  mode  ac/on

AC/ON turns calculator on and clears calculator functions
MODE switches to financial, statistical & business modes
CPT computes value of the next key that is pressed

Learning the Operational Keys

Fix

2nd  CPT  mode  ac/on

2nd operates second function above keys
Press 2nd, Fix, and number 2 to set decimal at two places.

Learning the Operational Keys

Fix

2nd  CPT  mode  ac/on

Arrow clears last number entered without clearing display
Enter the number 4789, then press arrow to remove 9, 8, etc.

Learning the Operational Keys

Fix

2nd  CPT  mode  ac/on

CMR clears last entry, pending operation, and display
CMR clears all mode registers. Press 2nd, CMR to clear.
Press 2nd, CMR, CMR to fully clear & start new problem.
Operational Keys in Review

CMR

CE/C

Fix

2nd

CPT

mode

ac/on

→

Fully clear—2nd, CMR, CMR
Set decimal—2nd, Fix, 2
Compute—CPT, key of unknown
Change mode—MODE (FIN, STAT, Business / blank)

Getting Down to Business

<table>
<thead>
<tr>
<th>2nd</th>
<th>CPT</th>
<th>mode</th>
<th>CST</th>
<th>SEL</th>
<th>MAR</th>
</tr>
</thead>
</table>

mode Business (blank)

CST Cost

SEL Selling Price

MAR Profit Margin

MU Markup

Markup versus Profit Margin

[.........SALE PRICE..........]

COST DIFFERENCE

MARKUP = difference/cost x 100

MARGIN = difference/price x 100

Markup versus Profit Margin

[.........SALE PRICE..........]

COST DIFFERENCE

MARKUP = 3/1 x 100 = 300%

MARGIN = 3/4 x 100 = 75%

Calculating Markups

(Sale Price $25 and Cost $10)

2nd CPT

MU

CST SEL ?

10 25 ?

MU

CPT 2nd

Markup = 150%

Calculating Profit Margins

(Sale Price $25 and Cost $10)

2nd CPT

MU

CST SEL MAR ?

10 25 ?

CPT MAR

Profit Margin = 60%
Calculating Price from Markup
(Cost $4.57 and Markup 300%)

\[
\begin{array}{c|c|c}
2\text{nd} & \text{CPT} & \text{MU} \\
\hline
\text{CST} & \text{SEL} & \hline
4.57 & ? & 300 \\
\hline
\text{CPT} & \text{SEL} & \\
\end{array}
\]

Sale Price = $18.28

Calculating Cost from Margin
(Sale Price $15 and Margin 75%)

\[
\begin{array}{c|c|c|c}
2\text{nd} & \text{CPT} & \text{CPT} & \text{CST} & \text{SEL} & \text{MAR} \\
\hline
\hline
? & 15 & 75 & \\
\hline
\end{array}
\]

Cost = $3.75

Calculating Percentages
(Price Discounts and Add-ons)

\[
\begin{array}{c|c|c|c|c}
\% & \text{CST} & \text{SEL} & \text{MAR} & \\
\hline
\hline
19.95 & (-) & 55 & \% = ? & 8.98 & - \\
\hline
\hline
\end{array}
\]

Price after 55% discount. List $19.95

\[
\begin{array}{c|c|c|c|c}
5 & (+) & 250 & \% = ? & 17.50 & = \\
\hline
\end{array}
\]

Price after 250% add-on. Cost $5.00

Patterns of Financial Calculating

- Present Value grows to Future Value
- Payments repay a Present Value
- Payments grow to Future Value
- Present Value generates Payments

Present Value to Future Value

- Capital Appreciation
- Growth of Savings
- Inflationary Impacts

\[
\begin{array}{c|c}
\text{PV} & \rightarrow \text{FV} \\
\hline
$60,000 & \text{grows to} 200,000 \\
\hline
\end{array}
\]

Payments Repay Present Value

- Business Development Loans
- Equipment Purchase Loans
- Personal Installment Loans

\[
\begin{array}{c|c|c|c|c}
\text{PV} & \leftrightarrow \text{PMT} & \text{PMT} & \text{PMT} & \\
\hline
$46,000 & \text{repaid by} & $540 & + & $540 & + & $540 \\
\hline
\end{array}
\]
Payments Grow to Future Value

- Savings Accumulation Fund
- Individual Retirement Account
- Investment Contribution Plan

\[
PMT \times PMT \times PMT \rightarrow FV
\]

\[3,000 + 3,000 + 3,000 \text{ grows to } 350,000\]

Present Value Provides Payments

- Saving Fund Disbursements
- Retirement Account Payments
- Distributions from Capital

\[
PV \rightarrow PMT \times PMT \times PMT
\]

\[60,000 \text{ generates } 2,500 + 2,500 + 2,500\]

Five Basic Financial Keys

\[
\begin{array}{cccc}
N & \%i & PV & PMT & FV \\
\end{array}
\]

- \(N\) is the total number of periods involved
- \(\%i\) is the interest rate per year or per period
- \(PV\) is the present value of the asset or account
- \(PMT\) are the payments made to or from account
- \(FV\) is the future value of the asset or account

All 4 Financial Calculations

\[
\begin{array}{cccc}
N & \%i & PV & PMT & FV \\
\end{array}
\]

- Grow a Sum
- Borrow
- Accumulate
- Disburse

Calculating Refinements

\[
\begin{array}{cccccc}
2nd & CPT & mode & N & \%i & PV & PMT & FV \\
\end{array}
\]

- Compounding
- Payments Left
- Loan payments left is found by entering known values and computing \(N\)
- Payments

\[2\times4 = 6+4 = 10,000 \rightarrow \text{CPT}\]

- Press 2nd, BGN before calculating beginning of period disbursements

Additional Loan Calculations

\[
\begin{array}{cccccc}
\text{CPT} & N & \%i & PV & PMT & FV \\
\end{array}
\]

- Calculate
- \(x\leftrightarrow y\)
- I/P
- BAL
- \(P_1/P_2\)

<table>
<thead>
<tr>
<th>180th Pmt Bal</th>
<th>180</th>
</tr>
</thead>
<tbody>
<tr>
<td>240th Pmt I &amp; P</td>
<td>(x\leftrightarrow y) 240 (go right to left here &amp; below)</td>
</tr>
<tr>
<td>13-24 Pmts I &amp; P</td>
<td>(x\leftrightarrow y) 13</td>
</tr>
</tbody>
</table>