Effective Use

Of the

HP12C

Calculator

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PLEASE NOTE: PUSH THE GOLD "F" KEY AND THE "CLX" (CLEAR) KEY BEFORE PERFORMING ANY FUNCTION.

EFFECTIVE USE OF THE
HP12C FINANCIAL CALCULATOR
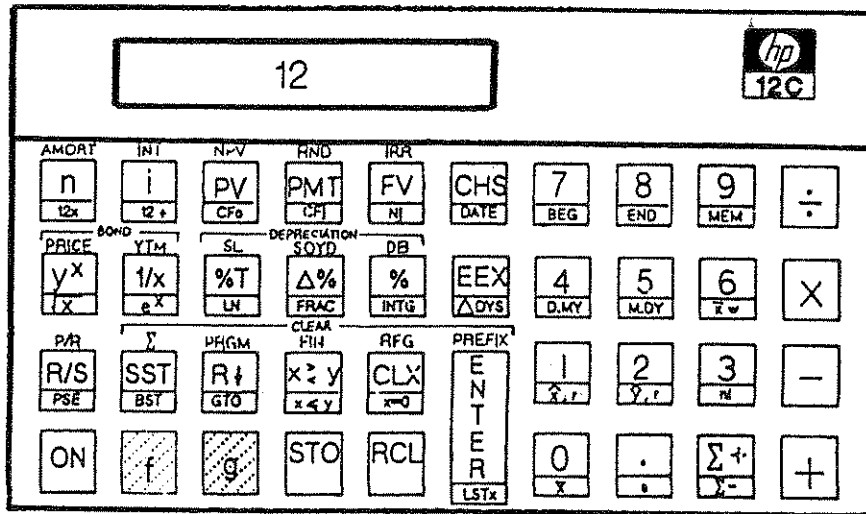
This manual is designed to help mortgage professionals and Real Estate professionals learn to utilize the functions of the Hewlett Packard HP12C Financial Calculator that specifically relate to mortgage finance. My goal is to make this calculator "user friendly" for you, so you won't feel overwhelmed by all of the different keys and functions they can perform. I won't be teaching every single function it can do, only the most basic functions you need to perform your job effectively. If you want to learn every function, read the manual provided by Hewlett Packard. The HP12C Financial Calculator is a wonderful calculator and can help you tremendously in your business, if you can just lose your fear of all the keys!
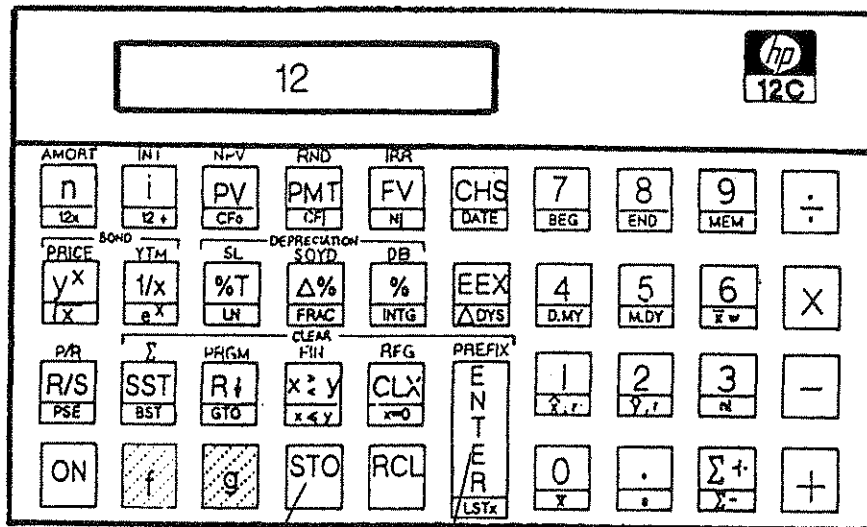
LEARNING THE BASICS

Let's begin with some very basic information. This calculator is really divided into two distinctly different functioning units. The right side of the calculator is laid out very much like a regular calculator - it adds, subtracts, multiplies and divides. You will notice there is no "equal (=) key. Rather than an equal key, the user must first enter the number and press *"Enter"*, then enter the second number and the corresponding key desired - add, subtract, multiply or divide. We will be doing some exercises later to get you used to this "backward" method.

The right side of the calculator has the ability to store information simply by hitting the *"STO"* key and the number "1", or store a second figure by hitting *"STO 2"*, *"STO 3"*, etc. You can store up to 18 figures on the right side of this calculator! After you get to *"STO 9"*, you can begin by hitting the *"STO"* key, then hitting the decimal and 1. Example - *"STO .1" = the 10th calculation, "STO .2" = the 11th calculation, STO.3" = the 12th calculation*, etc., all the way up to *"STO .9"*! Amazing! Of course, who could remember what you stored in Register No. 18? I couldn't! About the highest I could probably remember is about 4 or 5! (But it's there for you geniuses who want it!)
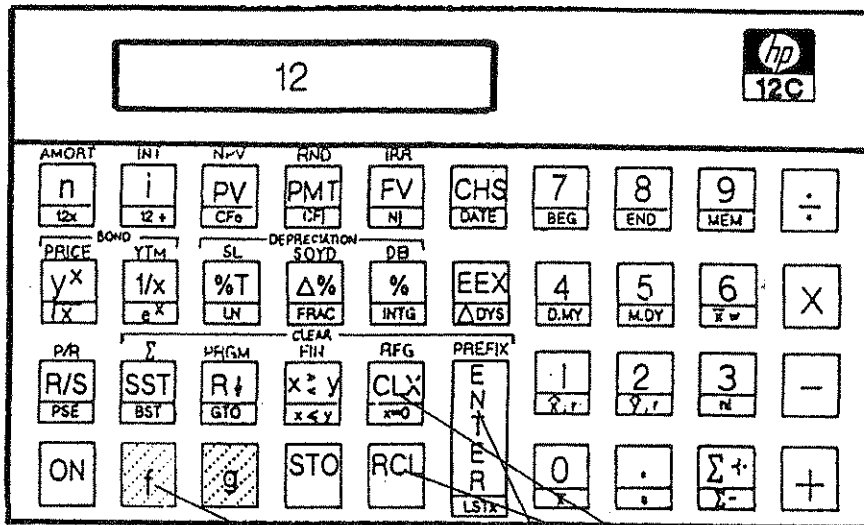
When you wish to retrieve information you have stored, simply press *"RCL"* and the corresponding number in which the information is stored. Example: *"RCL 1", or "RCL 2"*, etc. This information will remain stored in your calculator until you clear it out. To clear out all stored information, simply hit your gold *"f"* key and *"CLX"*. Simply hitting *"CLX"* will not clear out stored information, it only clears the last number you have displayed.

Here's a little tip to save you time: After you have completed calculating a sequence of numbers and wish to begin a new sequence, you *DO NOT HAVE TO HIT "CLX"*. As soon as you begin a new sequence of numbers and hit *"ENTER"* after the first number, the HP12C automatically begins calculating your new series of numbers.
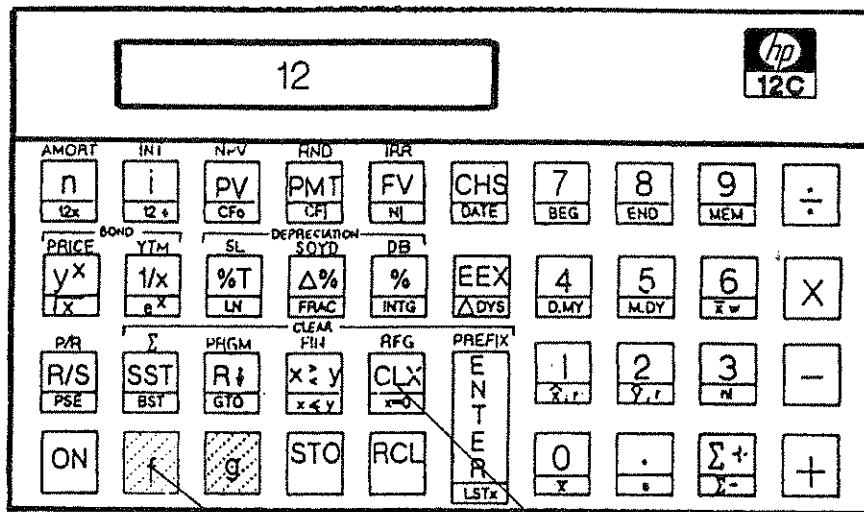
We will be discussing the functions on the left side of your calculator later, but I would like to mention one thing to you now. *All figures calculated on the left side are automatically stored in your calculator.* With each subsequent calculation, the new numbers will be entered on top of the old, then more numbers entered on top of the old. If you don't periodically clear out all registers, your calculator will begin throwing off your numbers.

SUGGESTION: Get into the habit of clearing out your calculator at least once a day. To completely clear out all your stored registers, hit your gold *"f"* key and *"CLX"*. If you only hit *"CLX"*, it clears out only the last number entered on your display; you must hit the gold *"f"* key to clear it out completely.

ANOTHER TIP: If you have calculated a sequence of numbers, and the last number you entered was incorrect -- You goofed! -- No problem! Simply hit *"CLX"* and it will only clear out the most recent number you incorrectly entered, not the previous numbers. Then re-enter the correct number and continue with your calculations.
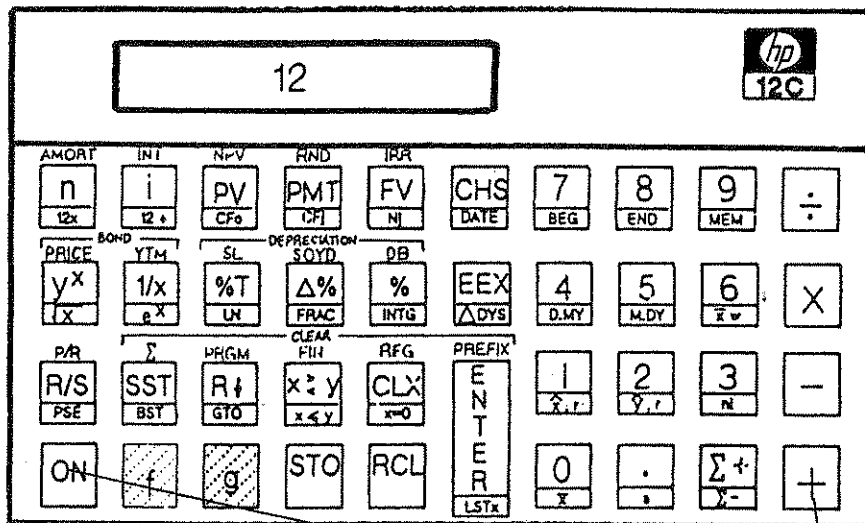
You will also notice this calculator doesn't have an *"Off"* key, just an *"On"* key. Well, the *"On"* key functions in both capacities. If you want to turn the calculator off, hit *"On"*. If it is left on for too long, it will automatically turn itself off, to save on your batteries. However, these batteries last forever! I've had my calculator for 16 years and have changed the batteries three times!

Here's another tip that will help you. After you have computed a sequence of numbers and begin a new sequence, as I mentioned earlier, you do not have to hit the *"CLX"* key. You simply begin calculating your new series of numbers. *BUT the old total is STILL IN YOUR CALCULATOR!* If you calculate a new sequence of numbers and want to total that sequence with the prior sequence, you simply hit the *"+" (plus)* key and it automatically adds the two numbers together! Here's an example. Add these numbers together:

Key Strokes	What Display Will Reflect
100 *"Enter*, 100 "+", 100 "+"	Display reflects 300
100 *"Enter*, 100 "+", 100 "+"	Display reflects 300
Now hit the "+" key	Display reflects 600
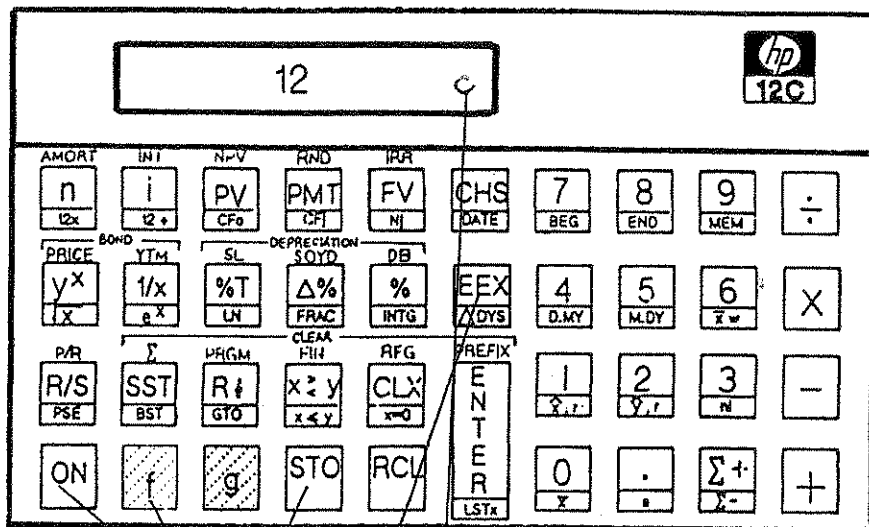
SETTING DECIMALS AND REMOVING "C" FROM YOUR DISPLAY

SETTING DECIMALS: You can set your calculator at the number of decimals you desire by simply hitting the gold *"f"* and the desired number of decimals. Example: *"f" 0 = . , "f" 1 = .0, "f" 2 = .00, "f" 3 = .000, "f" 4 = .0000.* You can enter up to 7 decimals on your calculator. I normally keep my calculator set on 4 decimals.

WHAT HAPPENS WHEN YOUR DISPLAY SHOWS A "," (COMMA) INSTEAD OF A "." (DECIMAL)? Simply turn off your calculator. Hold your finger on your decimal key, keeping the key depressed, then hit the *"On"* key. When the calculator comes on, your calculator will now display the decimal! (I had to call Hewlett Packard long distance to get the answer to this question when this came up once!)

IF YOUR DISPLAY SHOWS A *"c"* IN THE LOWER RIGHT SIDE, HIT *"STO"* AND *"EEX"* TO REMOVE IT.
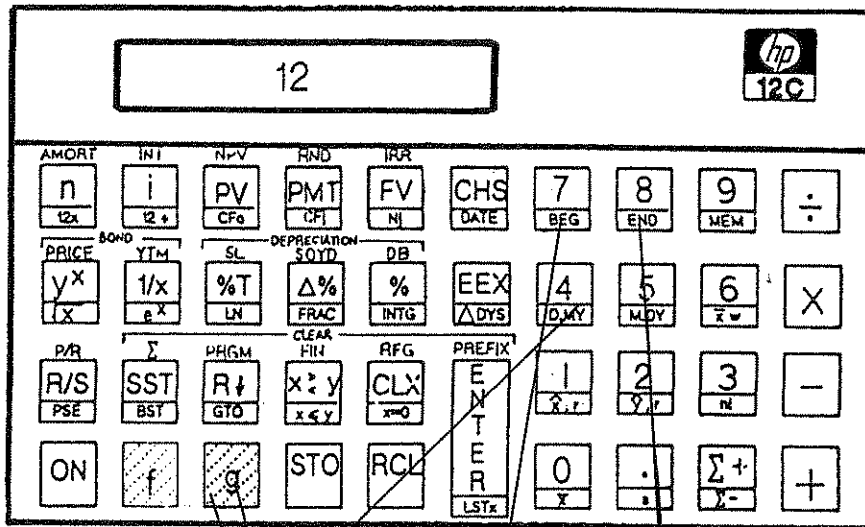
REMOVING *"DMY"* AND *"BEGIN"* FROM YOUR DISPLAY

The HP12C has a couple of functions that I've never used, the *"DMY"* and *"MDY"* keys (these symbols are in blue beneath the numbers 4 and 5), and the *"BEG"* and *"END"* keys (these symbols are in blue beneath the numbers 7 and 8). The Hewlett Packard manual can explain in more detail the functions these keys perform, but frankly, even after reading the manual, I don't use them!

The only thing I know, is if you turn on your calculator and the symbol *"DMY"* or *"BEGIN"* appears on your display, your calculations will be incorrect. To remove these symbols, follow this procedure:

- To remove *"DMY"*, hit the blue *"g"* key and 5 (*MDY* is in blue under it).

- To remove *"BEGIN"*, hit the blue *"g"* key and 8 (*END* is in blue under it).
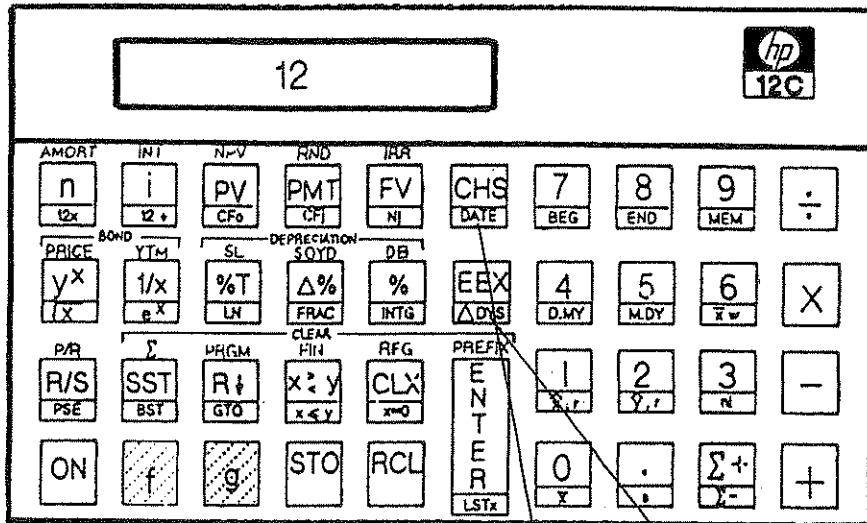
USING THE *"EEX/ΔDYS" AND "CHS/DATE"* KEYS

You will notice there are two keys above the *"ENTER"* key - the *"EEX"* key with the *"ΔDYS"* symbol in blue beneath it, and the *"CHS"* key (which changes a figure from a negative to a positive, or from a positive to a negative), which has *"DATE"* in blue beneath it.

The *"ΔDYS"* key can be used to give you the number of days that have passed between two known dates.

For example, a loan application was taken on April 1, 2002 and closed on May 3, 2002. How many days was the loan in process? Here's the sequence:

Key Strokes	What Display Will Reflect
Enter the first known date, April, which is the 4th month of the year: 4.012002 *"ENTER"* (Notice there are no spaces between the day of the month and the year.)	Display reflects 4.01 (2 decimals)
Enter the second known date: 5.032002 - Hit the blue *"g"* key and the *"EEX"* key. Hitting the blue *"g"* key activates the symbol *"Δ DYS"* shown in blue beneath the *"EEX"* key.	Display reflects 32 days

Let's try another example. A contract was written January 5, 2002, and closed March 15, 2002. How many days did this period of time cover?

Key Strokes	What Display Will Reflect
1.052002 *"ENTER"*	Display reflects 1.05 (2 decimals)
3.152002 *"g"* *"EEX"*	Display reflects 69 days

This function can also be used if you are trying to determine how many mortgage payments a borrower has made to date on his loan. I will be showing you later how to compute an unpaid balance on a borrower's loan, but you cannot determine an unpaid balance unless you know how many payments the borrower has made.

If you know the month and year in which the first payment was made, and the month and year the last payment was made, this method is much quicker than counting on your fingers!
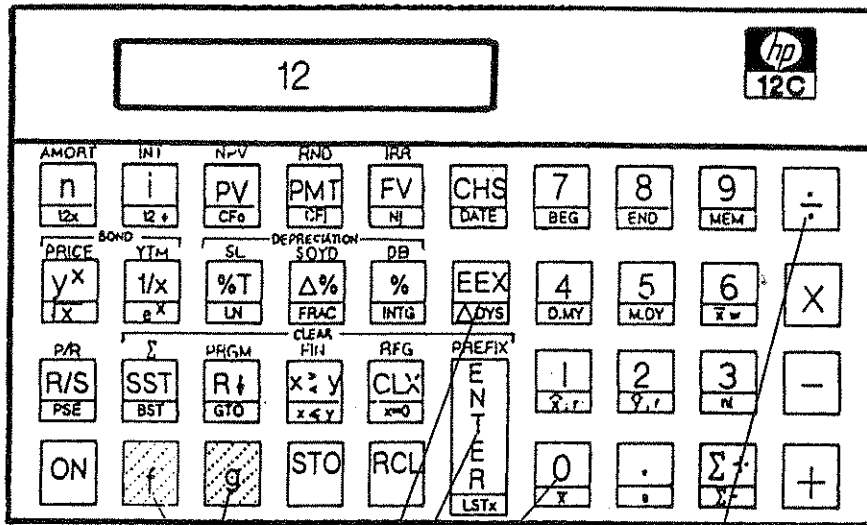
HOW TO DETERMINE THE NUMBER OF MORTGAGE PAYMENTS MADE TO DATE ON A LOAN

Problem: The borrower made the first mortgage payment March 1, 1993, and the last payment on May 1, 2002. How many payments have been made on this loan?

Key Strokes	What Display Will Reflect
Set decimals on "0" (zero) - Hit the gold "*f*" and "0"	Display reflects "0."
3.011993 "*ENTER*"	Display reflects 3.
5.012002 "*g*" "*EEX*"	Display reflects 3,348. days
Hit 30 (most months have 30 days) and the "÷" *(divide)* key	Display shows 112 months

If you count the number of months on your fingers, you will get the same answer! This is much quicker!
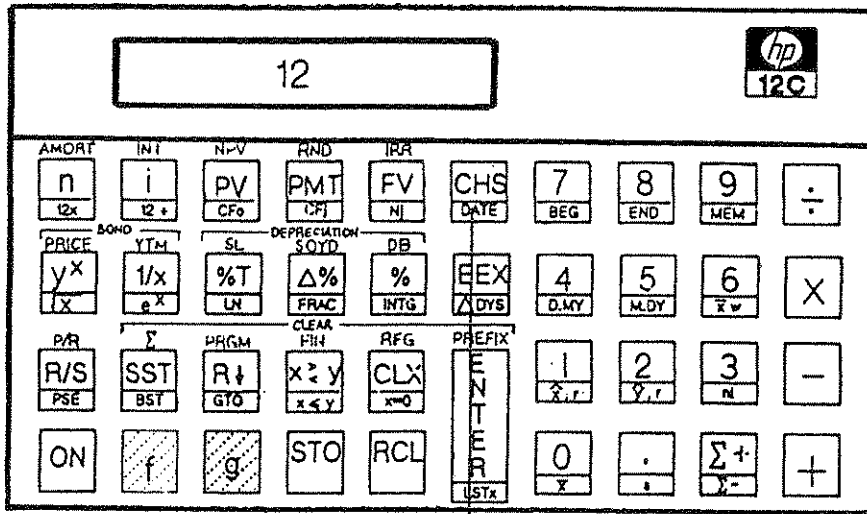
USING THE *"DATE"* (CHS) KEY

The *"DATE"* key -- shown in blue under the *"CHS"* key -- can be used to determine a future date that is a certain number of days in the future (or the past, for that matter!) This is helpful for a Loan Officer who wants to lock in a borrower's interest rate and needs to know the expiration date, or for a Realtor who wants to write a contract for a certain number of days and needs to know the expiration date.

Refer to the example on the next page to determine a future date.
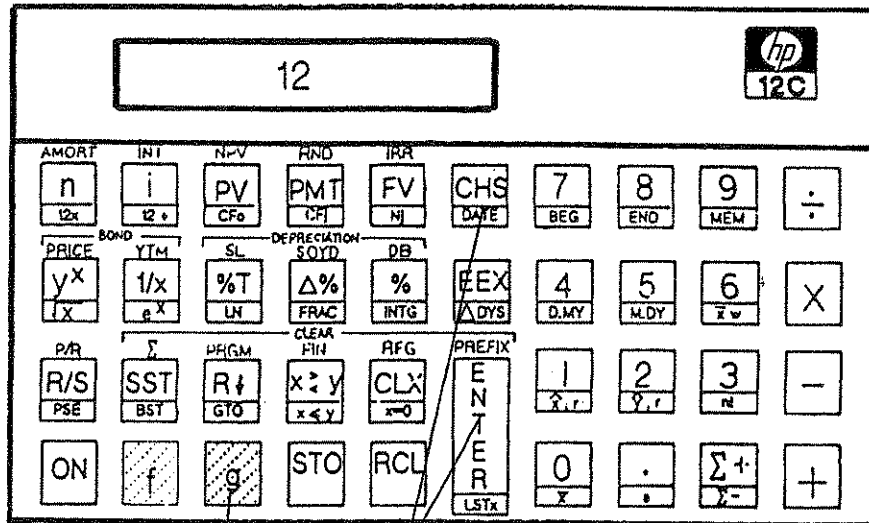
DETERMINING A FUTURE DATE

Problem: A Loan Officer wants to lock in a borrower's interest rate for 45 days. The loan was locked in May 5, 2002. What is the expiration date?

<u>Key Strokes</u>	<u>What Display Will Reflect</u>
5.052002 hit **"ENTER"** Enter 45 days — 45 **"g" "CHS" (DATE)**	Display reflects 5.05 (2 decimals) Display reflects 6,19,2002 3 The "3" represents Wednesday "1" represents Monday, "2" represents Tuesday, etc.
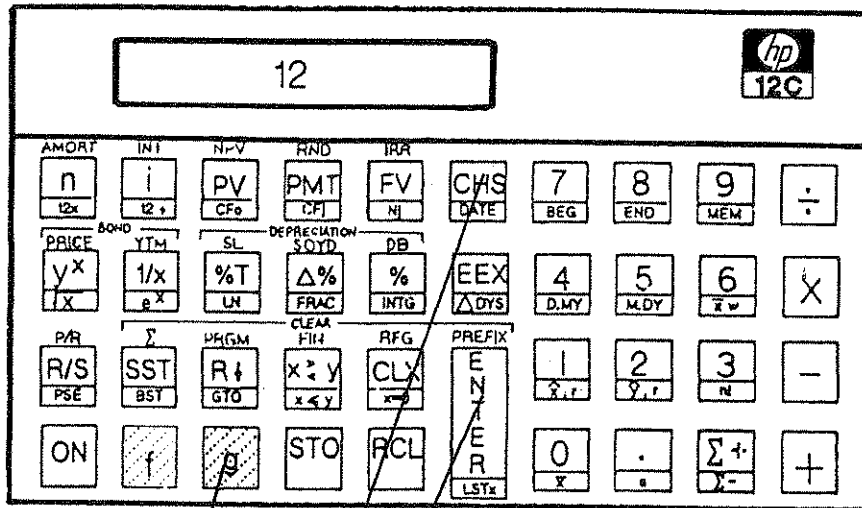
DETERMINING THE DAY OF THE WEEK ON WHICH YOU WERE BORN

Here's a neat trick! If you want to know what day of the week you were born, the HP12C can tell you! You simply enter your date of birth, then hit "0" (zero) *"g"* and *"CHS"*. The display will give you back your birth date, but will also tell you the day of the week! Let's look at an example.

Problem:　　Your date of birth is June 18, 1960. What day of the week was this date?

Key Strokes	What Display Will Reflect
6.181960 *"ENTER"* Hit 0 *"g"* *"CHS"*	Display reflects 6.18 (2 decimals) Display shows "6, 18, 1960 6". You were born on Saturday!

LET'S REVIEW – ANSWER THE FOLLOWING QUESTIONS

1.   A contract signed August 1, 2002 will expire in 90 days. What is the expiration date?_____ .

2.   A loan application is taken on August 15, 2002 and the rate locked in for 45 days. What is the expiration date? _____ .

3.   A loan application was taken on June 3, 2002 and closed on July 11, 2002. How many days did it take to process the loan? _____ .

4.   A purchaser has stated he must be in his new home no later than September 10, 2002. How many days from August 7, 2002 is that?_____ .
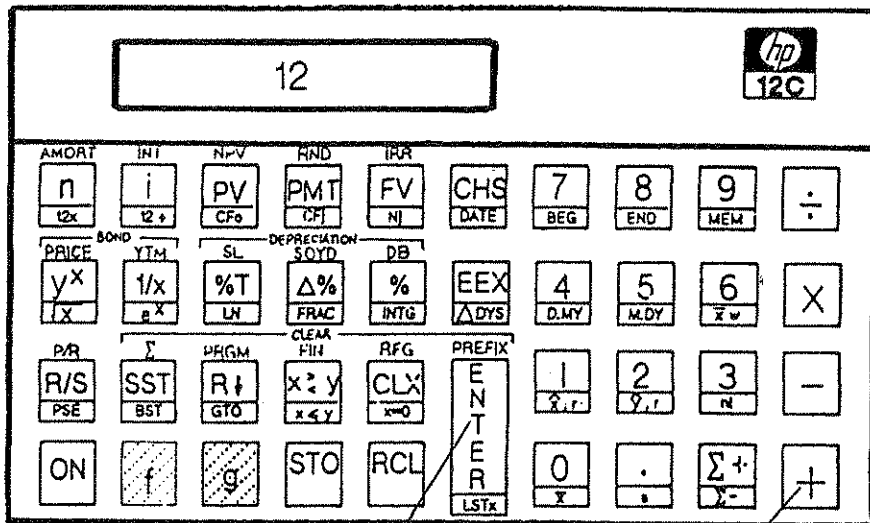
PERFORMING BASIC MATH FUNCTIONS

To perform basic math functions, remember that the HP12C works more like a computer than a calculator. This involves "number, Enter, number, symbol (add, subtract, multiply or divide)". It's backward!

EXAMPLE: To add 50 and 50, follow this procedure:

<u>Key Strokes</u>	<u>What Display Will Reflect</u>
50 *"ENTER"* 50 *"+"*	Display reflects 100.00 (2 decimals)

The advantage of this function is the elimination of the need to hit the *"CLX"* *(CLEAR)* key after each sequence ends, since each time you hit *"ENTER"* a new sequence automatically begins.

COMPUTE THESE BASIC MATH PROBLEMS

100 + 100 = _____   1,200 ÷ 7   = _____

875 - 432 = _____   10 X 8 ÷ 2 + 4 - 1 = _____

12 X 50   = _____   500 - 10 + 20   = _____
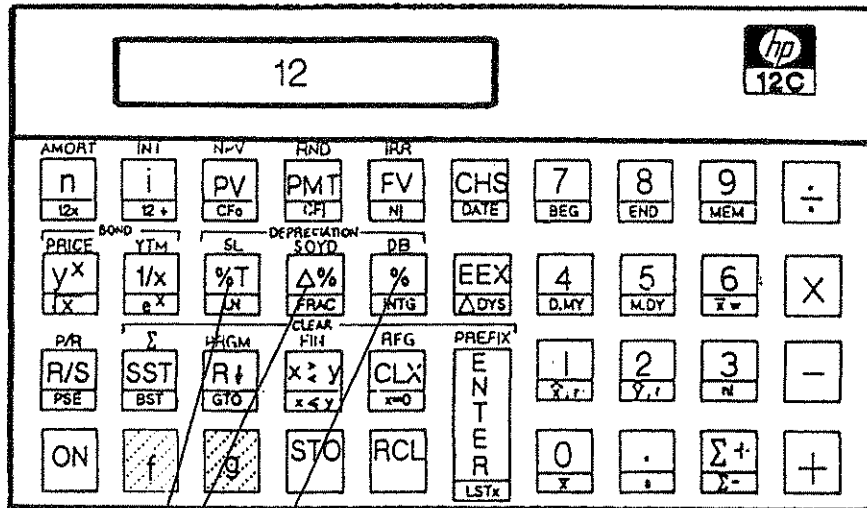
USING THE *"PERCENTAGE"* FUNCTIONS

There are three percentage keys on the HP12C:

1. The standard *"%"* key,

2. The *"Δ%"* key, which is used to determine the percentage difference between two numbers, and

3. The *"%T"* key, which can be used to calculate what percentage one number is of another.

Let's review the functions for each one of these keys.
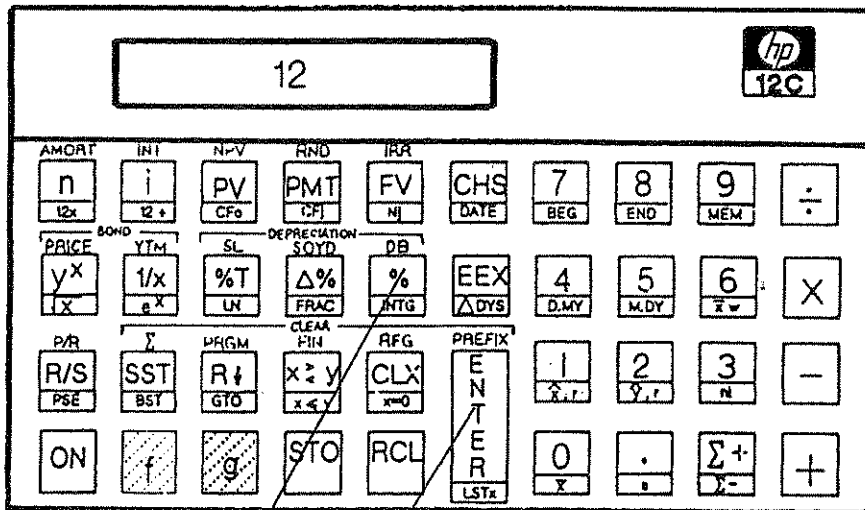
USING THE STANDARD "%" (PERCENTAGE) KEY

The first *"%"* key can be used to compute a maximum loan-to-value. For example, if a borrower is purchasing a $100,000 house and wants a 90% loan, compute as follows:

Key Strokes	What Display Will Reflect
100,000 *"ENTER"* 90 *"%"*	Display reflects 100,000.00 Display reflects $90,000 as the loan amount.

COMPUTE THE FOLLOWING LOAN AMOUNTS USING THE "%" KEY

1.   Compute a 95% loan on a sales price of $89,900   _____

2.   Compute a 90% loan on a sales price of $150,000   _____

3.   What is 80% of $159,000?   _____

4.   What is 75% of $50,000?   _____

5.   What is 25% of each of the following?

      A. 500   _____
      B. 849   _____
      C. 763   _____
      D. 378   _____
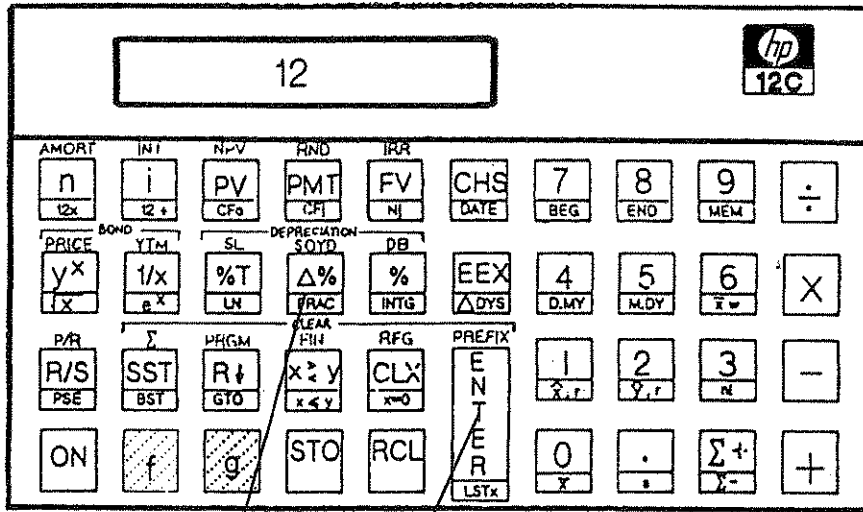
USING THE "Δ%" (PERCENTAGE DIFFERENCE) KEY

If you want to know the difference between two known figures, this key can be used for that purpose. This is helpful if you want to know how much housing prices fell, or how much interest rates have increased.

EXAMPLE

The price of a house fell from $100,000 to $97,500. What was the percentage of decrease?

Key Strokes	What Display Will Reflect
100,000 "ENTER" 97,500 "Δ%"	Display reflects 100,000.00 Display reflects "-2.50". It's shown as a negative because it decreased.
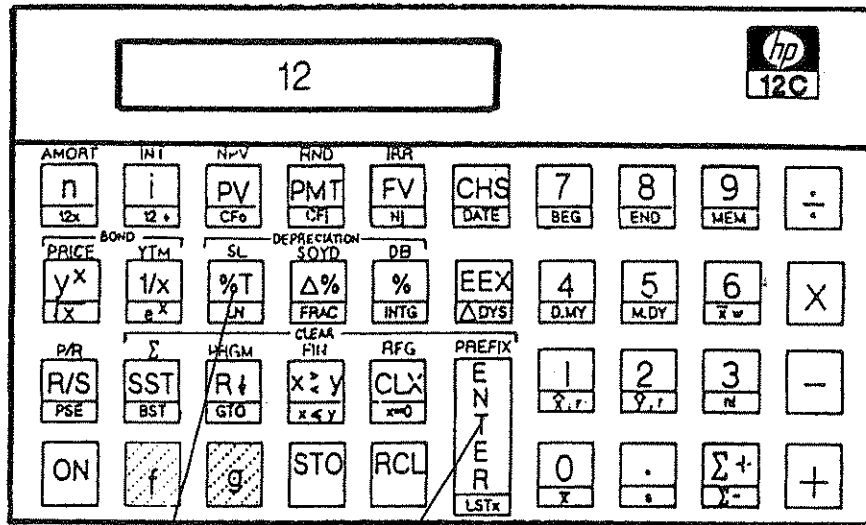
USING THE "%T" (TOTAL PERCENTAGE) KEY

This key can be used to determine what percentage one number is of another. For example, a sales price was $100,000, the offered price is $94,500. What percent of $100,000 is $94,500?

Key Strokes	What Display Will Reflect
100,000 *"ENTER"* 94,500 *"%T"*	Display reflects 100,000.00 Display reflects 94.50% The offer was 94.50% of the original sales price.

COMPUTE THESE PROBLEMS
USING THE "Δ%" AND "%T" KEYS

1.   A lot was purchased for $20,000 and sold for $25,000. What was the mark-up as a percentage increase?

   Mark-Up Value Increase   _____

2.   A property was listed for $149,000 and sold for $145,000. What was the percentage reduction in the asking price?

   Percentage Reduction   _____

3.   What percent of 800 is 24?   _____

4.   What percent of 1,000 is 50?   _____

5.   A parcel of land was purchased for $50,000 and sold for $57,500. Calculate the percentage increase in value.

   Percentage Increase In Value   _____
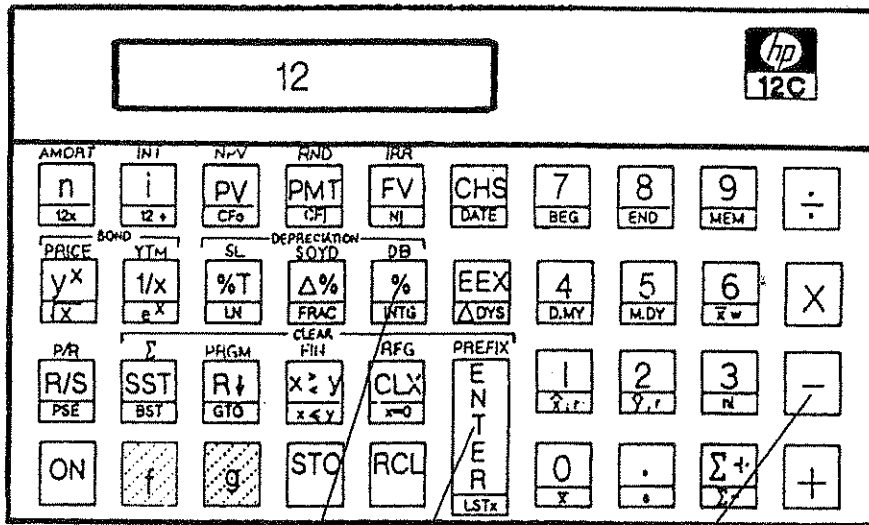
CALCULATING LOAN AMOUNTS AND DOWN PAYMENTS

To compute a loan amount, follow this formula:

Sales Price *"ENTER"*
Loan-to-Value *"%"* Key -- Display Reflects Loan Amount
Hit the *"-" (Subtract)* Key to Get The Down Payment

EXAMPLE: Compute the loan amount and down payment for a $150,000 sales price at a 90% loan-to-value

Key Strokes	What Display Will Reflect
150,000 *"ENTER"*	Display reflects 150,000.00
90 hit the *"%"*	Display reflects 135,000.00 Loan Amount
Hit the *"-" (Subtract)* key	Display reflects 15,000.00 Down Payment

COMPUTE THESE PROBLEMS

Sales Price	Loan-to-Value	Loan Amount	Down Pmt.
$ 90,000	95%	$_____	$_____
$ 99,000	90%	$_____	$_____
$125,000	90%	$_____	$_____
$142,000	90%	$_____	$_____
$150,000	80%	$_____	$_____
$165,000	80%	$_____	$_____
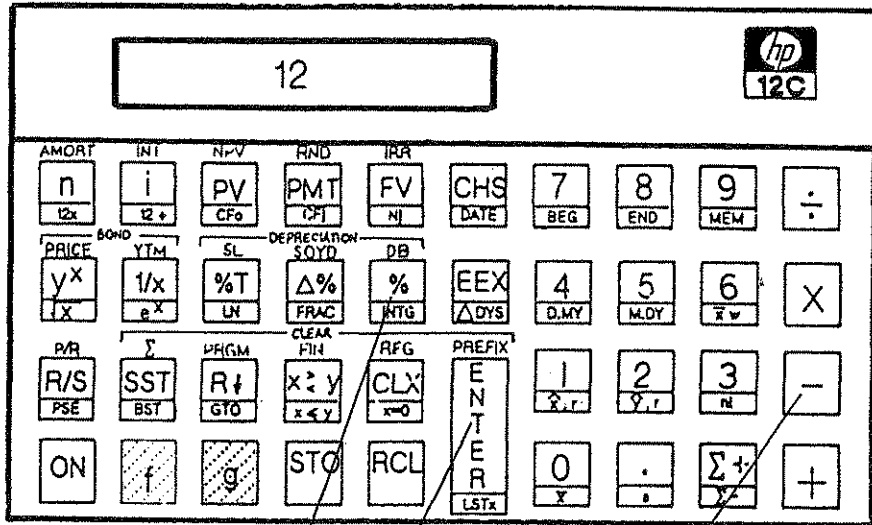
"ROUNDING DOWN" TO THE
NEAREST $50.00 INCREMENT

In those cases in which the computed loan amount needs to be rounded down to the nearest $50.00 increment, you should be able to tell from looking at the loan amount how much needs to be rounded down to get a $50.00 increment. Simply subtract that number, hit *"Subtract"* and *"Subtract"* again.

EXAMPLE: Figure the loan amount and down payment on a $98,900 sales price financing a 90% loan-to-value:

Key Strokes	What Display Will Reflect
98,900 *"ENTER"*	Display reflects 98,900.00
90 hit the *"%"* key	Display reflects 89,010.00 — This loan amount must be rounded down
Hit 10, *"Subtract"*	Display reflects 89,000.00
Hit *"Subtract"* again	Display reflects 9,900 Down Payment

COMPUTE THESE PROBLEMS

Sales Price	LTV	Un-Rounded Loan	Subtract Difference	Rounded Loan	Down Payment
$ 78,900	95%	$_____	$_____	$_____	$_____
$ 89,900	90%	$_____	$_____	$_____	$_____
$ 93,450	90%	$_____	$_____	$_____	$_____
$ 98,950	90%	$_____	$_____	$_____	$_____
$105,200	80%	$_____	$_____	$_____	$_____
$126,900	80%	$_____	$_____	$_____	$_____
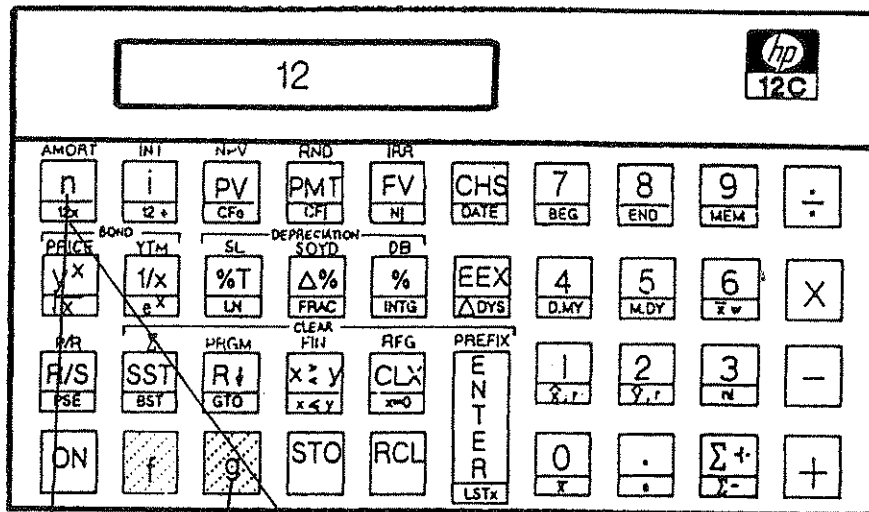
CALCULATING PRINCIPAL & INTEREST

In order to determine the monthly P & I, you need to know the loan amount, the interest rate, and the term of the loan. The HP12C can then solve for the answer.

The four keys in the upper left side of the HP12C are used to compute P & I. Beginning from the left, moving right, these keys are:

1.   The *"n"* key refers to the number of payments to be made. This would be 360 for a 30 year loan or 180 payments for a 15 year loan.

- You could enter 360/180 and hit the *"n"* key, or enter 30 (years), hit the blue *"g"* key first, then hit *"n"*.

- You will notice under the *"n"* key in blue you will see *"12x"*.

- Entering 30, then *"g"* *"n"* automatically multiplies 30 X 12 to give you 360 payments.
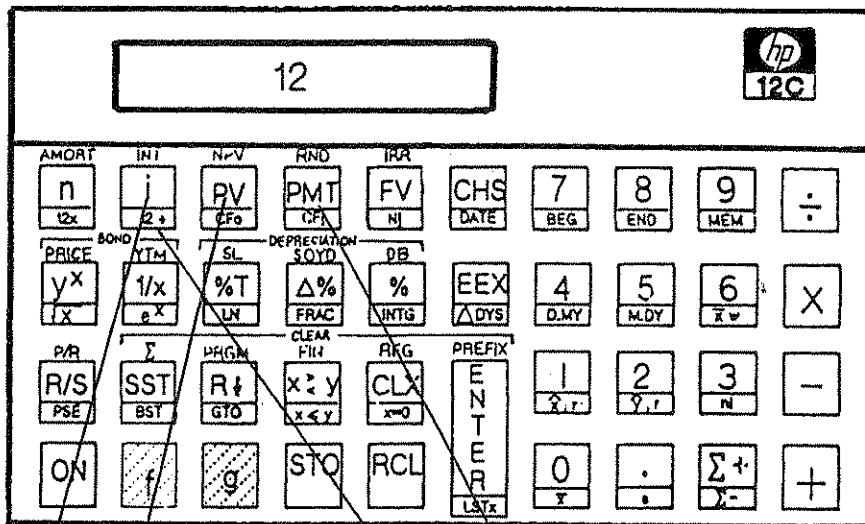
2.   The *"i"* key refers to the annual interest rate. For computing *MONTHLY* payments, we need to get the interest rate down to a monthly rate.

*   You will note the *"i"* key has a *"12÷"* shown in blue beneath it.

*   To divide an annual interest rate by 12, simply hit the blue *"g"* key, then hit the *"i"* key.

3.   The *"PV"* key represents the loan amount, and the *"PMT"* key represents the payment.

The order in which you enter your information does not matter, as long as the *"PMT"* key is hit last.

Some people prefer to enter the loan amount *first,* then number of payments, rate, and *"PMT"*. Whatever you are comfortable with is OK. For me, working from left to right, in that sequence, is the easiest way.

EXAMPLE OF CALCULATING
PRINCIPAL & INTEREST PAYMENTS

Determine the monthly P & I for a loan of $100,000, 7% rate, 30 years.

Key Strokes	What Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
360 *"n"* (or you could hit 30 *"g"* *"n"* to get the same answer)	Display reflects 360
7 *"g"* *"i"*	Display reflects 0.58 (2 decimals)
100,000 *"PV"* *"PMT"*	Display reflects principal and interest of -665.30 — This is a ***negative*** because the monthly payment is ***money going out***. If the loan is entered as a positive, the payment will be a negative.
To change the monthly P & I to a positive, hit the *"CHS"* key located to the left of the *"7"* key.	Display reflects 665.30.

Remember also that all information computed on the *LEFT* side of your HP12C is automatically stored in the calculator unless you hit *"f"* *"CLX"*. This can be a tremendous benefit to you if you learn how to use it.

You can simply hit *"RCL"* *"PV"* and your loan amount will be recalled. Or you can hit *"RCL" "PMT"* and the P & I will be recalled. This saves the trouble of having to re-enter it every time!

This can also be helpful if you are working with a customer who wants you to compute payments based on various loan amounts or interest rates.

EXAMPLE:

You have computed the payment for the loan amount shown above. Now the customer asks, what if the rate is 7.25%?

Key Strokes	What Display Will Reflect
Hit 7.25 *"g" "i" "PMT"*	Display reflects -682.18

The other information is already STORED — you don't have to re-enter everything all over again!

Or the customer could ask what the payment would be if they borrowed $95,000 at a rate of 7.25% instead of $100,000.

Key Strokes	What Display Will Reflect
Enter 95,000, hit *"PV" "PMT"*	Display reflects -648.07

COMPUTE P & I FOR THESE LOAN AMOUNTS

INTEREST RATE: 7%
TERM OF LOAN: 30 YEARS/360 PAYMENTS

$ 90,000 Loan Amount $_____   Switch to 7.5% Rate $_____

$ 79,500 Loan Amount $_____   Using Same Loan $_____

$125,000 Loan Amount $_____ $_____

$179,900 Loan Amount $_____ $_____

$136,950 Loan Amount $_____ $_____

$129,900 Loan Amount $_____ $_____

CLEAR YOUR CALCULATOR BEFORE GOING TO THE NEXT PAGE. TO CLEAR, HIT "f" "CLX".
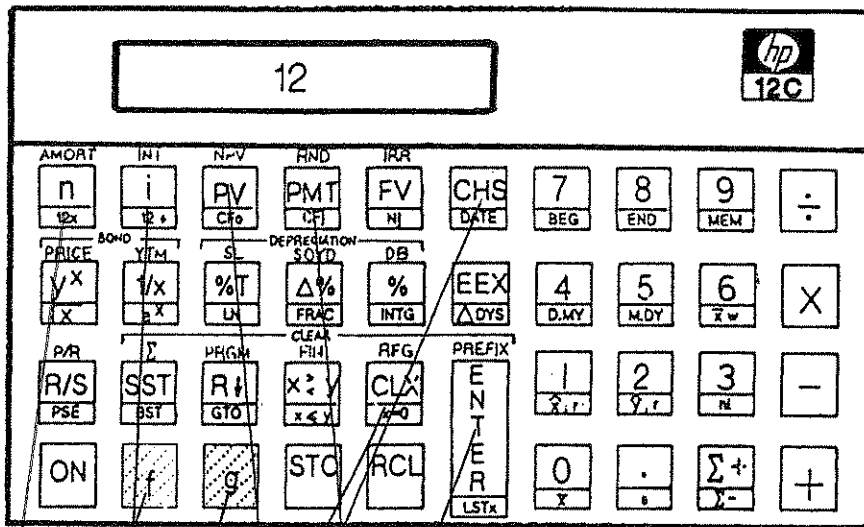
MORE EXAMPLES

1. If a borrower asks how paying an additional $100 per month would affect the length of time to pay off the mortgage, compute the answer as follows:

   Compute a $100,000 loan at 7%, 30 year term:

Key Strokes	What Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
360 *"n"*, 7 *"g"* *"i"*, 100,000 *"PV""PMT"*	Display reflects -665.30
To add $100 to monthly payments:	(shown as a negative)
100 *"CHS"* *"ENTER"*	Display reflects -100.00
"RCL" *"PMT"*	Display reflects -665.30
Hit the *"+"* key	Display reflects -765.30
Hit the *"PMT"* key to store the new payment	
Hit the *"n"* key (calculator will run for a min.)	Display reflects 247 Payments
Enter 12 and hit the *"÷"* *(divide)* key	Display reflects 20.58 Years

2. If a borrower asks how much the monthly payment on their 30 year loan needs to be increased in order to pay off the loan in 20 years:

Key Strokes	What Display Will Reflect
Hit *"f" "CLX"* to clear your calculator. 360 *"n"* 7 *"g" "i"* 100,000 *"PV" "PMT"* Enter 20 and hit *"g" "n"* Hit the *"PMT"* key	 Display reflects -665.30 Display reflects 240 payments Display reflects -775.30 - This is the monthly payment needed to pay off the loan in 20 years.

3. If a borrower asks how quickly his 30 year loan can be paid off if he makes an additional mortgage payment a year (this is what the Hewlett Packard people told me):

Key Strokes	What Display Will Reflect
Hit *"f" "CLX"* to clear your calculator. 360 *"n"* 7 *"g" "i"* 100,000 *"PV" "PMT"* Divide by 12 months - Hit 12 *"÷"* Hit *"RCL" "PMT"* and hit the *"+"* key Hit the *"PMT"* key to store new loan amount Hit the *"n"* key Divide by 12 - Hit 12 *"÷"*	 Display reflects -665.30 Display reflects -55.44 Display reflects -720.74 Display reflects 285 payments Display reflects 23.75 years

---

COMPUTE THE FOLLOWING PROBLEMS

---

1. Loan amount of $95,000, rate of 7.5%, 30 years. If $50.00 is added to the monthly payment, how quickly will the loan be paid off?

   _____

2. Loan amount of $125,000, 6.75% rate, 30 years. One additional mortgage payment per year. In how many years would the loan be paid off?

   _____

3. Loan amount of $189,900, 7.25% rate, 30 years. Loan term reduced to 20 years. How much is the new monthly payment?

   _____
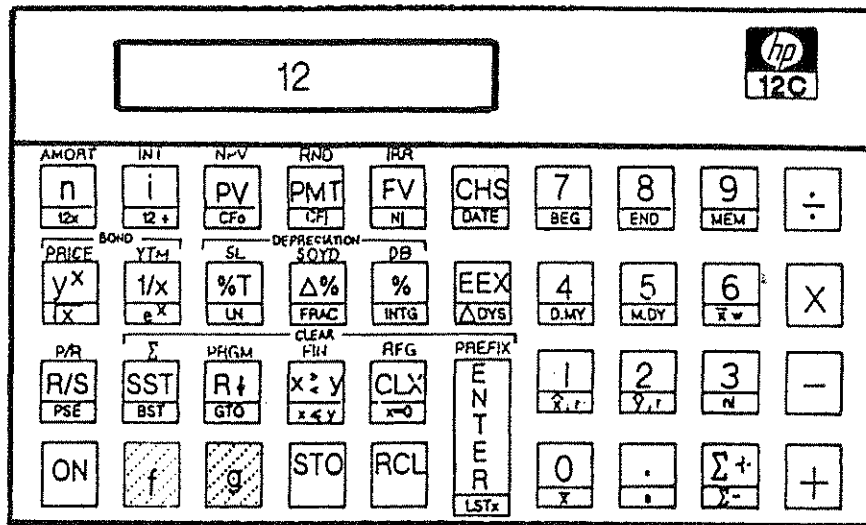
LEARNING TO *"SOLVE"* FOR AN ANSWER

When calculating the monthly principal and interest payments, you are supplying the calculator with the basic information for the number of payments, the annual interest rate, and the loan amount, asking the calculator to **SOLVE FOR THE PRINCIPAL & INTEREST PAYMENTS.**

This same concept can be used in other ways. For example, if you are talking to a borrower who:

- Knows what the monthly principal and interest payment is, and
- Knows that the term of the loan is 30 years/360 payments, and
- Knows the amount of the original loan, but cannot remember the interest rate,
- It is easy for you to determine that rate simply by entering into the calculator **WHAT YOU _DO_ KNOW AND ASKING IT TO SOLVE FOR WHAT YOU _DON'T_ KNOW.**

EXAMPLE:

Your borrower knows that the loan amount was $100,000, knows that the monthly principal and interest is $733.76 and knows that the term of the loan was for 30 years, but the borrower cannot remember the interest rate. You can determine the interest rate as follows:

Key Strokes	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
Hit 360 *"n"*	Display reflects 360 payments
Enter 100,000 and hit *"PV"*	Display reflects 100,000
Enter 733.76 and Hit *"CHS "PMT"*	Display reflects -733.76
Hit the *"i"* key - calculator begins running	Display reflects 0.67 (2 decimals)
	Display reflects 8.00 interest rate
Enter 12 and hit the *"x" (times)* key	

EXAMPLE:

Your borrower knows that the interest rate is an 8%, 30-year rate, and the monthly principal and interest is 733.76, but cannot remember the original loan amount. You can determine the original loan amount as follows:

Key Strokes	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
Enter 360 and hit *"n"*	Display reflects 360
Enter 8 and hit *"g" "i"*	Display reflects 0.67 (2 decimals)
Enter 733.76 and hit *"CHS" "PMT"*	Display reflects -733.76
Hit the *"PV"* key	Display reflects 99,999.38, most likely a loan of 100,000.00
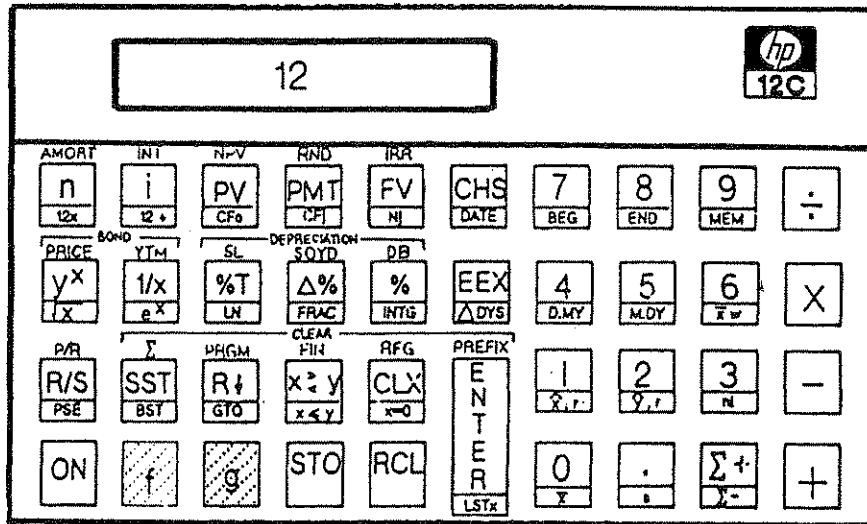
CALCULATING A *"BUYDOWN"*
WITH SELLER-SUBSIDIZED PAYMENTS

A *"Buydown"* is a wonderful loan program to help sell tons of houses! On a buydown, the seller is paying a portion of the borrower's monthly mortgage payments for the first 2 years. If you remember that all the information calculated on the left side of the HP12C is automatically stored, this can make calculating a buydown a breeze!

EXAMPLE: The loan amount is $100,000, the note rate is 7%, 30 years. This will be a 2-1 buydown, with the seller paying down the monthly payments year 1 to 5%, and year 2 to 6%. We want to determine how much the buydown will cost the seller:

<u>Key Strokes</u>	<u>What the Display Will Reflect</u>
Hit *"f"* *"CLX"* to clear your calculator	
Hit *"f"* and 2 for 2 decimals	Display reflects 0.00
Compute P & I at 7%:	
360 *"n"* 7 *"g"* *"i"* 100,000 *"PV"* *PMT"*	Display reflects -665.30
Hit *"STO"* and 1 to store this number	
Compute P & I at first-year payment of 5%:	
You don't have to hit 360 *"n"* since this is already stored. Just hit 5 *"g"* *"i"* *"PMT"*	Display reflects -536.82
Hit *"RCL"* and 1	Display reflects -665.30
Hit the *"-"* *(subtract)* key	Display reflects 128.48 — the first-year monthly subsidy paid by the seller
Enter 12 and hit the *"x"* *(times)* key	Display reflects 1,541.77
Hit *"STO"* and 2 to store this number	
Compute P & I at second-year payment of 6%:	
Hit 6 *"g"* *"i"* *"PMT"*	Display reflects -599.55
Hit *"RCL"* and 1	Display reflects -665.30
Hit the *"-"* *(subtract)* key	Display reflects 65.75
Enter 12 and hit the *"x"* *(times)* key	Display reflects 789.02 — the second-year monthly subsidy paid by the seller
Hit *"RCL"* and 2	Display reflects 1,541.77
Hit the *"+"* *(plus)* key	Display reflects 2,330.79 — the total cost of the two-year subsidy

---

CALCULATE THE FOLLOWING PROBLEM

Calculate a 2-1 buydown. The loan amount is $193,600, note rate is 7%, 30 years, first year payment rate is 5%, second year payment rate is 6%.

Compute P & I at 7% $_____ (Hit *"STO"* 1)

Compute P & I at 5% $_____
Hit *"RCL"* 1 & subtract $_____ X 12 = $_____ (Hit *"STO"* 2)

Compute P & I at 6% $_____
Hit *"RCL"* 1 & subtract $_____ X 12 = $_____

Hit *"RCL"* 2 and the "+" key $_____
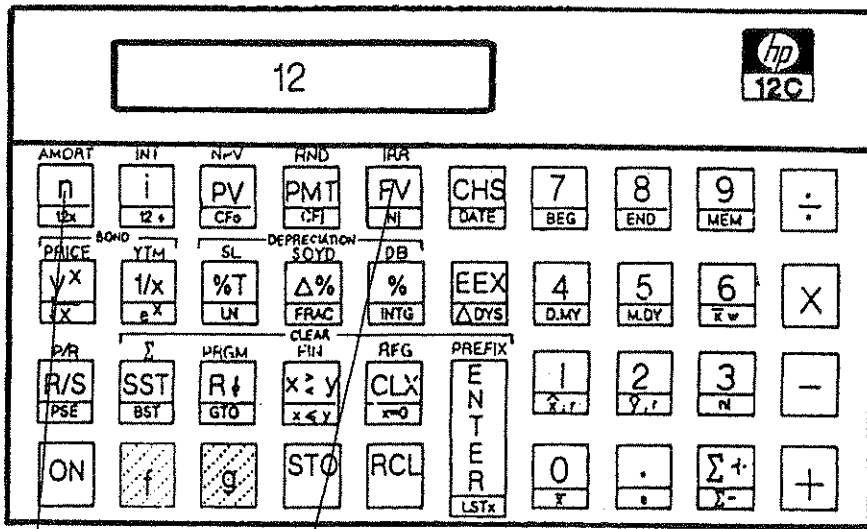
CALCULATING THE UNPAID PRINCIPAL BALANCE ON A LOAN

The HP12C can compute the unpaid principal balance on a borrower's loan if you have the basic information. You need to know the original loan amount, interest rate and term.

To calculate an unpaid principal balance:

- Compute the P & I on the original loan,

- Determine how many payments have been made to date and enter in your calculator, then

- Hit *"n"* and *"FV"*. That's it! Let's try one:

EXAMPLE: Original loan was $95,000, rate was 8%/30 years. The first mortgage payment was made February 1, 1996, the last payment was made May 1, 2002. (We will use the quick method for determining how many payments have been made.)

Key Strokes	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator Compute the P & I at 8%: 360 *"n"* 8 *"g" "i"* 95,000 *"PV" "PMT"*	Display reflects -697.08
Enter date of first mortgage payment: 2.011996 *"ENTER"*	Display reflects 2.01
Enter date of last mortgage payment: 5.012002 Hit *"g" "EEX"*	Display reflects 2,218.00 days
Divide by 30: Enter 30 and hit the *"÷" (divide)* key	Display reflects 76.03 months
Hit the *"n"* and *"FV"* key	Display reflects -88,753.48 — the current unpaid balance

CALCULATE THE UNPAID PRINCIPAL BALANCE ON THE FOLLOWING LOANS

Original Loan	Interest Rate	First Payment	Last Payment	No. Pmts. Made to Date	Unpaid Balance
$99,900	8.25%	4-1-94	5-1-02		
$169,400	7.75%	11-1-95	5-1-02		
$186,500	8.125%	6-1-96	5-1-02		
$125,000	7.50%	3-1-97	5-1-02		
$156,800	7.25%	5-1-98	5-1-02		
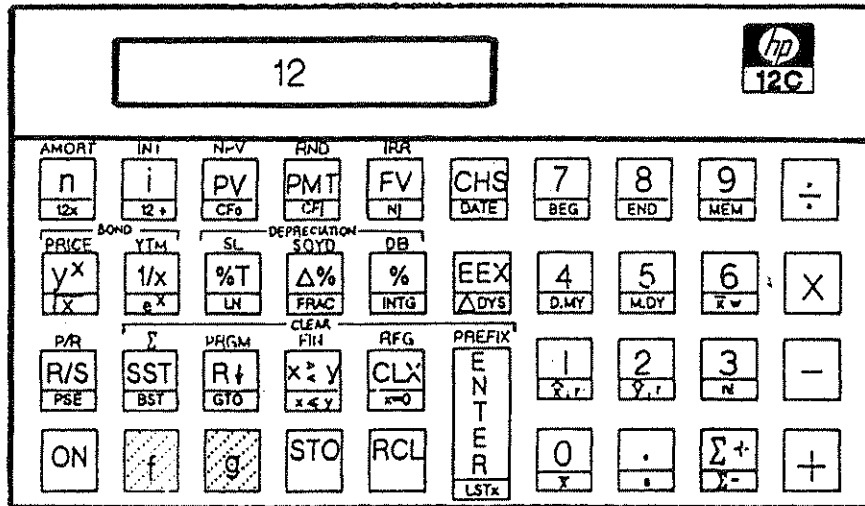
CALCULATING INTEREST AND PRINCIPAL PAID YEAR-TO-DATE

If your borrower would like to know how much interest and principal has been paid to date on his loan, the HP12C can do that also!

Once again, you need to know the basics about the loan: The original loan amount, rate, term, and how many payments have been made to date. But with this information, you can provide this information.
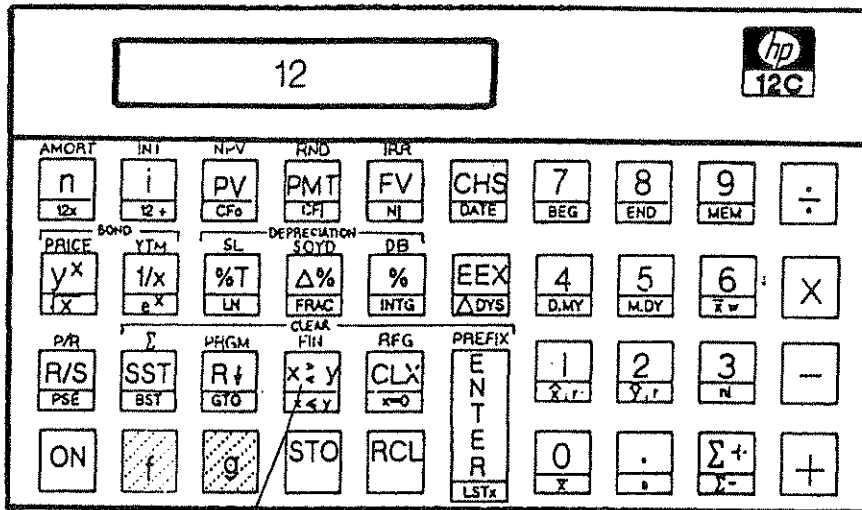
EXAMPLE: Let's use the example on the previous page using a $95,000 loan, rate of 8%/30 years, first payment made February 1, 1996, last payment made May 1, 2002, with 76 payments made to date.

<u>Key Strokes</u>	<u>What the Display Will Reflect</u>
Hit *"f"* *"CLX"* to clear your calculator Compute the monthly P & I: 360 *"n"* 8 *"g"* *"i"* 95,000 *"PV"* *"PMT"* Enter 76, hit *"f"* and *"n"* - calculator will run for a minute Hit the *"x/y"* key Hit *"RCL"* *"PV"*	 Display reflects -697.08 Display reflects -46,696.20 — interest paid year-to-date Display reflects -6,281.88 — principal paid year-to-date Display reflects 88,718.12 — current unpaid principal balance

You will notice that the current unpaid principal balance is just slightly different from the unpaid balance we got earlier using the *"quick method"*. The figure reflected above is actually the more accurate of the two figures, however the other unpaid balance we got using the *"quick method"* is still close enough.
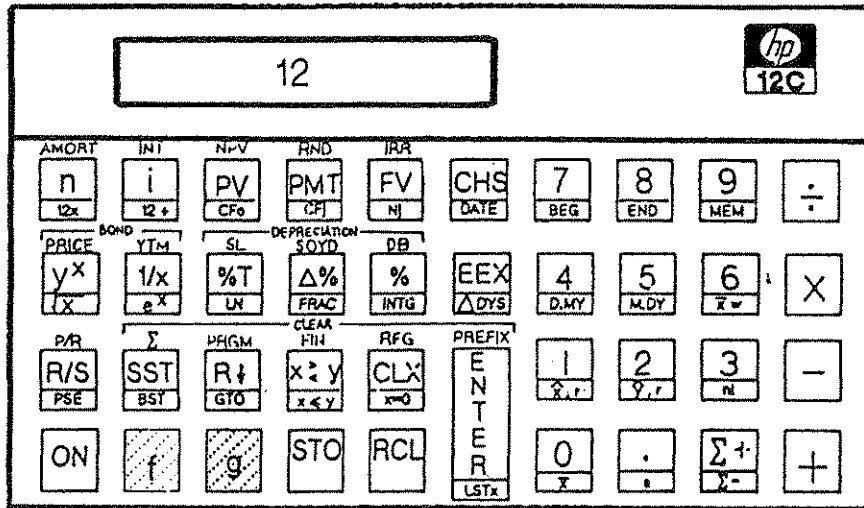
CREATING AN AMORTIZATION SCHEDULE

The HP12C can actually create an entire amortization schedule, if you wanted to take the time to work through 360 payments! It's a great way to find out exactly how much monthly payments are being applied to principal (not much!) — try it if you want to be depressed!

As before, you need the basic information on the loan, original loan amount, rate and term. Compute your monthly P & I as before and when this is completed, you can follow this formula:

EXAMPLE: Using the same example of a $95,000 loan, 8% rate/30 year term, let's amortize the first few payments on this loan:

Key Strokes	What Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
Compute the monthly P & I:	
360 *"n"* 8 *"g" "i"* 95,000 *"PV" "PMT"*	Display reflects -697.08
Hit 1 *"f" "n"*	Display reflects -633.33 — Interest paid on the *first payment*
Hit the *"x/y"* key	Display reflects -63.75 — Principal paid on the *first payment*
Hit *"RCL" "PV"*	Display reflects 94,936.25 — Unpaid balance after the *first payment*
Hit 1 *"f" "n" AGAIN*	Display reflects -632.91 — Interest paid on the *second payment*
Hit the *"x/y"* key	Display reflects -64.17 — Principal paid on the *second payment*
Hit *"RCL" "PV"*	Display reflects 94,872.08 — Unpaid balance after the *second payment*
Hit 1 *"f" "n" AGAIN*	Display reflects -632.48 — Interest paid on the *third payment*
Hit the *"x/y"* key	Display reflects -64.60 — Principal paid on the *third payment*
Hit *"RCL" "PV"*	Display reflects 94,807.48 — Unpaid balance after the *third payment*

REMEMBER: To amortize a loan, each time you must *hit 1 AGAIN AND AGAIN -- UP TO 360 PAYMENTS* — if you want to create a complete amortization schedule. If you enter 2, or 3, or 4, you are amortizing that number of payments together.

CREATE AN AMORTIZATION SCHEDULE

Create an amortization schedule for the following loan for the first 5 months of the loan:

Loan Amount: $112,500
Rate/Term: 7.5%/30 Years

**Payment
  No.**   **Interest Paid**   **Principal Paid**   **Unpaid Balance**

Payment No.	Interest Paid	Principal Paid	Unpaid Balance
1	$ _____	$ _____	$ _____
2	$ _____	$ _____	$ _____
3	$ _____	$ _____	$ _____
4	$ _____	$ _____	$ _____
5	$ _____	$ _____	$ _____
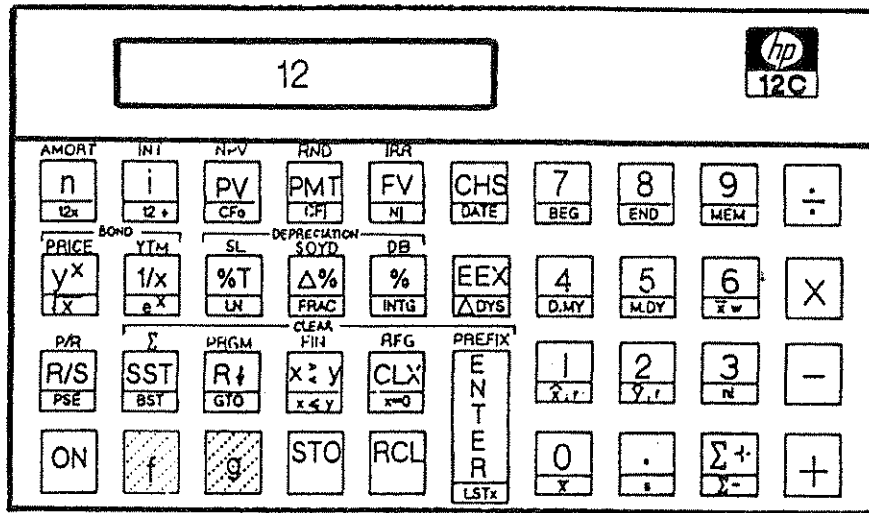
CALCULATING A BALLOON PAYMENT

Calculating the unpaid balance on a balloon note is basically handled the same way as calculating the unpaid balance on any loan. If you have the basic information about the loan and know how long the balloon is for, you can figure the unpaid balance quickly. Here is an example:

EXAMPLE: $100,000 Loan Amount, 7% rate/30 year amortization
Note will balloon in 5 years (which is 60 payments)

Key Strokes	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator Compute the monthly P & I: 360 *"n"* 7 *"g"* *"i"* 100,000 *"PV"* *"PMT"* Hit 60 *"n"* *"FV"*	 Display reflects -665.30 Display reflects -94,131.59 — Balance due in 5 years

If payments are made in different periods, i.e., quarterly or annually, use the following formula:

EXAMPLE: $100,000 Loan Amount, 7% Rate/30 Year Term
Paid Quarterly/Will Balloon at the End of Year 5

Key Strokes	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
30 *"ENTER"* 4 *"x"* - hit *"n"*	Display reflects 120 payments
7 *"ENTER"* 4 *"÷"* - hit *"i"*	Display reflects 1.75 — Quarterly interest rate
100,000 *"PV"* *"PMT"*	Display reflects -1,999.32 — Quarterly payment
Hit 5 (No. Years for Balloon) *"ENTER"* 4 *"x"* Hit *"n"*	Display reflects 20
Hit the *"FV"* key	Display reflects -94,090.79 — Unpaid Balance in 5 Years

If payments are made annually, use the following formula:

EXAMPLE: $150,000 Loan Amount/9.25% Rate/30 Year Term
Paid Annually /Will Balloon at the End of Year 5

Key Strokes	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	Display reflects 30.00 — Number of payments in 30 years @ 1 per year
30 *"n"*	
9.25 *"i"*	Display reflects 9.25 — Interest charged for each payment (Since there is only one payment per year, you don't divide the rate)
150,000 *"PV"* *"PMT"*	Display reflects -14,925.21
5 (No. Years for Balloon) *"n"* *"FV"*	Display reflects - 143,683.40 — Unpaid balance due in 5 years

There are all sorts of combinations you can use for balloon payments, based on the agreed-upon payment method:

- If they pay *monthly*, you figure 360 payments in a 30 year loan, with an annual interest rate divided by 12.

- If they pay *quarterly*, there will only be 120 payments in a 30 year loan, with an annual interest rate divided by 4.

- If they pay *bi-monthly*, there will be 780 bi-monthly payments in a 30 year loan, with an annual interest rate divided by 26.

- If they pay *annually*, there will be 30 payments in a 30 year loan, with an annual interest rate that's not divided by anything! Mostly, this is just logic.

COMPUTE THE FOLLOWING PROBLEMS

(Hit *"f"* *"CLX"* first to clear your calculator.)

1. Loan Amount $98,000
    Interest Rate/Paid Monthly   7%
    Compute Monthly P & I $_____
    5 Year Balloon - Compute Unpaid Balance $_____

2. Loan Amount $143,000
    Interest Rate/Paid Quarterly   7.25%
    Compute Quarterly P & I $_____
    5 Year Balloon - Compute Unpaid Balance $_____

3. Loan Amount $95,000
    Interest Rate/Paid Bi-Monthly   7.50%
    Compute Bi-Monthly P & I $_____
    5 Year Balloon - Compute Unpaid Balance $_____

4. Loan Amount $135,000
    Interest Rate/Paid Annually   7.75%
    Compute Annual P & I $_____
    5 Year Balloon - Compute Unpaid Balance $_____

CALCULATING A TRUTH-IN-LENDING DISCLOSURE

The HP12C can be used to calculate a Truth-in-Lending Disclosure also. Most companies perform this function on a computer, but it's kind of nice to know how to do it by hand if the need ever arises. Let's take a look at an example.

EXAMPLE:

Loan Amount	$90,000
Interest Rate	8%/30 Years
Monthly P & I	$660.39
Monthly PMI	$39.00

Fees *Borrower* Pays *Lender* Gets:

1% Origination	$900.00
1% Discount Point	-0-
Tax Service Fee	75.00
Underwriting Fee	200.00
Document Preparation Fee	150.00
Flood Certification Fee	20.00
Courier Fee	50.00
30 Days Interest Adjustment	591.78
2 Mos. PMI (No Up-Front PMI)	78.00
TOTAL	$2,064.78

When calculating a Truth-in-Lending Disclosure, the only fees that will be used in the calculation are those fees the ***Borrower Pays*** (not the seller) and the ***Lender Gets*** (not a third party, like the credit bureau or the appraiser — unless the appraiser is a salaried appraiser employed by the mortgage company, in which case the appraisal fee will go into the lender's pocket).

This can be very confusing! If your software prepares a Good Faith Estimate that lists all of the fees, totals them up, then deducts the seller's contribution, then you must decide which fees the seller's contribution will be applied to. Here's a word of advice: *Since the fees the <u>borrower</u> pays to the <u>lender</u> will result in a higher APR, apply the seller contribution <u>first</u> to those fees shown on the previous page.*

Any fee paid by the borrower to the lender is called a *"Finance Charge"*. What is classified as a finance charge has been hotly debated by lenders and attorneys! To make your job a little easier, I've provided a list of fees on the next page. Review these fees carefully before proceeding to the worksheet.

The two-page worksheet is followed by an explanation of each section with step-by-step instructions for completing the worksheet.

FEES THAT _DO_ AFFECT THE _APR_

Fees such as tax service fees and PMI fees do not go into the lender's pocket, however these fees *charged to the borrower benefit the lender.* They don't do a thing for the borrower. A tax service fee allows the lender to access the borrower's annual property tax bill, rather than depending on the borrower to provide the information. PMI protects the lender in the event the borrower defaults, it *does not* protect the borrower. Flood certification protects the lender in the event the property is located in a flood zone.

The inspection fee is only considered a finance charge *if the lender's employee makes an inspection and the lender charges a fee for this service.* If the inspection is made by a third party, such as an appraiser, who will be paid a fee for this service, it does not benefit the lender, and is therefore *not* considered a finance charge.

We might argue that courier fees do not go into the lender's pocket, however the service *benefits the lender,* not the borrower, and is therefore considered a finance charge.

Trying to determine what does and does not constitute a finance charge has kept many, many attorneys awake at night, wondering if they told their lender clients the right thing! In most cases, when in doubt, *show it as a finance charge!*

FEES THAT *DO* AFFECT THE *APR*

Administration Fee
Amortization Schedule
Application Fee
Appraisal Retype
Appraisal Review and Re-certification
Appraisal Update
Assignment Fee
Binder Fee
Broker Fee (Unless Paid by Lender)
Borrower's Verification Fee
Buydown/Subsidy Fee
Closing Administration Fee
Closing Fee
Commitment Fee
Coupon Fee
Discount Fee
Document Prep. (Broker/Lender)**
EPA Endorsement
Escrow Mail Fee
Final Inspection
Flood Letter/Certification
Funding Fee
Inspection Photo Fee
Lender's In-House Attorney or Courier
Lender's In-House Attorney Doc. Prep.
Lock-In Fee
Long Distance Charges
FHA Mortgage Insurance Premium (MIP)
MIP Paid in Cash
Miscellaneous Fees
Mortgage Lender Fees
NFIS *(In Some States)*

FEES THAT *DO* AFFECT THE *APR* (Cont'd)

Origination Fees
Per Diem Interest
PMI Premium and Reserves
Processing Fee
Property Inspection
Re-certification of Value
Redraw Fee
Refinance Fee
Restrictions
Retainer Fee
Review Fee
Review Appraisal
Tax Service Fee
Underwriting Fee
VA Funding Fee
VOD Fee
Warehouse Fee
Wire Transfer Fee

FEES THAT *DO NOT* AFFECT THE *APR*

Alarm System
Appraisal Fee
Appraisal Photos
Appraisal Mileage
Attorney's Fees
Chimney Repair
Credit Report Fee
Document Preparation Fee** *(Third Party)*
Document Stamp Tax
Escrow Fee
Escrow Shortage Fee
Filing Fee
Intangible Tax
Lead-Based Paint Test
MIP Credit
MIP Refund
Mortgage Tax
Overage to Broker
Property Insurance
Recording Fee
Repair Escrow Reserve
Survey Fee
Survey Report
Termite Inspection
Title Fee
Title Inspection
Title Opinion
Title Review
Well/Septic Inspection
Yield Spread Premium

WORKSHEET FOR COMPUTING THE TRUTH-IN-LENDING DISCLOSURE
FIXED RATE LOANS

ANNUAL PERCENTAGE RATE The cost of credit as a yearly rate.	FINANCE CHARGE The dollar amount the credit will cost you.	AMOUNT FINANCED The amount of credit provided on your behalf.	TOTAL OF PAYMENTS The amount you will have paid after you have made all payments as scheduled.
___8.73___ %	$___156,747.18___	$___87,935.22___	$___244,682.40___
5	4	3	2

NUMBER OF PAYMENTS	AMOUNT OF PAYMENTS	WHEN PAYMENTS ARE DUE	NUMBER OF PAYMENTS	AMOUNT OF PAYMENTS	WHEN PAYMENTS ARE DUE
178	$699.39	First Day of Month			
182	$660.39	First Day of Month			
1					

The Hewlett Packard HP12C Financial Calculator was used to compute the TRUTH-IN-LENDING DISCLOSURE, as follows:

1. **NUMBER OF PAYMENTS**

   If the borrower is paying monthly PMI, the lender uses a *"worst-case scenario"*, which requires PMI to be terminated at "mid-point". For a 30-year loan, this would be Year 15, or after 180 months. This means that PMI is collected for the first 180 months of the loan, and no PMI is collected for the last 182 months of the loan. In most cases, 2 months are collected up front at closing, which means that 178 payments will include PMI and 182 payments will not include PMI.

   Mo.P&I $___660.39___ + MO.PMI $___39.00___ = $___699.39___ X ___178___ Pmts. = $___124,491.42___

   Mo.P&I $___660.39___ with NO PMI -------------- = $___660.39___ X ___182___ Pmts. = $___120,190.98___

   2. **TOTAL OF PAYMENTS** = $___244,682.40___

3. **AMOUNT FINANCED**

   A. LOAN AMOUNT $___90,000.00___ LESS B. $___2,064.78___ = $___87,935.22___

   B. Items *Borrower* Pays that *Lender* Gets:

Loan Orig. Fee	$___900.00___	Other	$_____
Discount Pts.	_____	___30___ Days Int. Adj.	___591.78___
Tax Serv. Fee	___75.00___	First Year PMI	_____
Doc. Prep. Fee	___150.00___	2 Mos. PMI Escrowed	___78.00___
Underwrit. Fee	___200.00___	FHA MIP Up Front	_____
Insp. Fee	_____	2 Mos. MIP Escrowed	_____
Flood Cert.	___20.00___	VA Funding Fee	_____
Courier Fee	___50.00___	TOTAL (B Above)	$___2,064.78___

4. **FINANCE CHARGE**

Total of Payment	$___244,682.40___	(No. 2 Above)
Less Amt. Financed	$___87,935.22___	(No. 3 Above)

   FINANCE CHG. $___156,747.18___
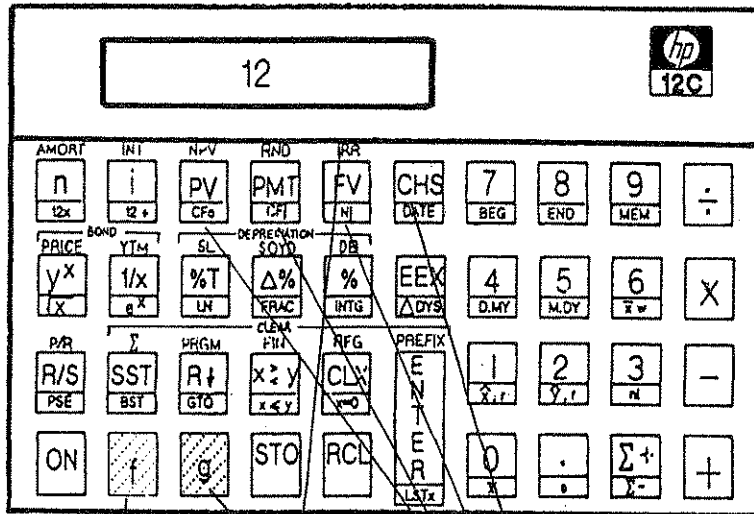
WORKSHEET FOR COMPUTING THE TRUTH-IN-LENDING DISCLOSURE (Cont'd)

To compute the APR using the Hewlett Packard HP12C Financial Calculator, use the following formula:

Enter *"AMOUNT FINANCED"* (From No. 3 Above)   Hit *"CHS"*, *"g"*, & *"C F o"* Key (*"PV"* Key)

Enter P&I + Mo. PMI for first 180 Payments   Hit *"g"*, & *"C F j"* Key (*"PMT"* Key)

Enter Number of Payments*   Hit *"g"* & *"Nj"* key (*"FV"* Key)

*The Hewlett Packard HP12C Financial Calculator is not equipped to compute more than 99 payments at once. Therefore, you must break it down into 99 payments first, then 79 payments remaining for the *first 178 payments including PMI,* then 99 payments first, and 83 payments remaining for the *last 182 payments with no PMI.* as follows:

5.   ANNUAL PERCENTAGE RATE

1. *"Amount Financed"*	$ 87,935.22		Hit *"CHS"*, *"g"*, & *"CF o"*
2. P&I + Mo. PMI .	$ 699.39		Hit *"g"* & *"C F j"*
3. No. Pmts. W/PMI		99	Hit *"g"* & *"Nj"*
4. P&I + Mo. PMI	$ 699.39		Hit *"g"* & *"C F j"*
5. No. Pmts. W/PMI		78	Hit *"g"* & *"Nj"*
6. P&I W/No PMI	$ 660.39		Hit *"g"* & *"C F j"*
7. No. Pmts. W/ No PMI		99	Hit *"g"* & *"Nj"*
8. P&I W/No PMI	$ 660.39		Hit *"g"* & *"C F j"*
9. No. Pmts. W/No PMI		83	Hit *"g"* & *"Nj"*

10. This will total the number of payments in a 30-year loan

11. Total Payments   360

12. Hit the *gold "f"* Key & *"IRR"* (*"FV"*) Key   =   0.73 % (Monthly Interest Rate)

13. Multiply No. 12 X 12 to get the Annual Rate   8.73 %
    APR

Number of Payments	Amount of Payments	When Payments are Due
178	$699.39	First Day of Month
182	$660.39	First Day of Month
1		

1. NUMBER OF PAYMENTS

If the borrower is paying monthly PMI, the lender uses a *"worst-case scenario"*, which requires PMI to be terminated at *"mid-point"*. For a 30-year loan, this would be Year 15, or after 180 months. This means that PMI is collected for the first 180 months of the loan, and no PMI is collected for the last 180 months of the loan.

If two months' PMI was collected at closing, that leaves 178 payments that will <u>*include*</u> *PMI.*

178 Payments of P&I	$660.39
Plus Monthly PMI	<u>39.00</u>
Total	$699.39
182 Payments of P&I only	$660.39

<table>
<tbody>
<tr><td colspan="2" align="center">

TOTAL OF PAYMENTS
The amount you will have paid after you have made all payments as scheduled.

$ 244,682.40

2

</td></tr>
</tbody>
</table>

Mo.P&I		$ 660.39
+ MO.PMI		$ 39.00
	=	$ 699.39
X 178 Pmts.	=	$ 124,491.42
Mo.P&I		$ 660.39
with NO PMI --------	=	$ 660.39
X 182 Pmts.	=	$ 120,190.98
2. TOTAL OF PAYMENTS	=	$ 244,682.40

AMOUNT FINANCED
The amount of credit
provided on your behalf.

$____87,935.22____

3

---

3. **AMOUNT FINANCED**

    A.   **LOAN AMOUNT** $ 90,000.00

         LESS

    B.   *Below*   = $ 2,064.78

    B.   Items *Borrower* Pays that *Lender* Gets:

Loan Orig. Fee	$ 900.00
Discount Pts.	(Seller)
Tax Serv. Fee	75.00
Doc. Prep. Fee	150.00
Underwriting Fee	200.00
Inspection Fee	
Flood Cert.	20.00
Courier Fee	50.00
Other _____	
Other _____	
__30__ Days Int. Adj.	591.78
First Year PMI	
2 Mos. PMI Escrowed	78.00
FHA MIP Up Front	
2 Mos. MIP Escrowed	
VA Funding Fee	
TOTAL (B Above)	$ 2,064.78

FINANCE CHARGE
The dollar amount the credit will cost you.

$ _____ 156,747.18 _____

4

---

4. FINANCE CHARGE

Total of Payment	$ 244,682.40
	(No. 2 Above)
Less Amt. Financed	$ 87,935.22
	(No. 3 Above)
FINANCE CHG.	$ 156,747.18

ANNUAL PERCENTAGE RATE
The cost of credit as a yearly rate.

$$\frac{8.73}{5} \ \%$$

A financial calculator will give you the answer to Number 4 if you input the information for Numbers 1-3 below.

EXAMPLE:

1.	Loan Amount	$90,000.00
2.	Interest Rate	8%
3.	Term	30 Years/360 Months
4.	Solve for Payment	?
		($660.39)

To calculate the APR, you input the answers to Numbers 1-3 below, and it will give you the answer to Number 4 below.

EXAMPLE:

1. **Loan Amount**   '**$87,935.22**
    (For Truth-in-Lending purposes, the Loan Amount
    used to calculate APR is the "Amount Financed".)

2. **Term**   **30 Years/360 Months**

3. **Payment (Including PMI)**   **$699.39**

4. **Solve for Rate**   **?**
                                                    (8.87%)

Of course, this APR is incorrect. The above calculation was based on the monthly PMI continuing for the life of the loan (360 payments).

Under the new federal ruling, PMI may only continue until the mid-point of the loan (180 payments, *or 178 if two months' PMI is collected at closing).*

To determine an accurate APR, you would have to calculate:

---

178 Payments of P&I *Plus* Monthly PMI
if two months' PMI is collected at closing,

Plus

182 Payments of P&I with *No* Monthly PMI
if two months' PMI is collected at closing

---

or

---

180 Payments of P&I *Plus* Monthly PMI
if two months' PMI *is not collected at closing,*

Plus

180 Payments of P&I with *No* Monthly PMI
if two months' PMI *is not collected at closing.*

To calculate APR using a Hewlett Packard HP12C Financial Calculator, keep in mind that the calculator is only designed to calculate **_99 payments at once_**. This means you would need to calculate:

IF TWO MONTHS' PMI IS COLLECTED AT CLOSING:

 99 Payments of P&I + Monthly PMI
 _79_ Payments of P&I + Monthly PMI
178 Total _with_ PMI

THEN CALCULATE:

 99 Payments of P&I w/No Monthly PMI
 _83_ Payments of P&I w/No Monthly PMI
182 Total _without_ PMI

178 + 182 = 360 Total Payments

### IF TWO MONTHS' PMI IS _NOT_ COLLECTED AT CLOSING:

 99 Payments of P&I + Monthly PMI
 _81_ Payments of P&I + Monthly PMI
180 Total _with_ PMI

THEN CALCULATE:

 99 Payments of P&I w/No Monthly PMI
 _81_ Payments of P&I w/No Monthly PMI
180 Total _without_ PMI

180 + 180 = 360 Total Payments

(The example below is based on the assumption that 2 months' PMI <u>was</u> collected at closing.)

<u>ANNUAL PERCENTAGE RATE</u>

1.	*"Amount Financed"*	$ <u>87.935.22</u>
2.	Hit *"CHS", "g", & "C F o" ("PV" Key)*	
3.	P&I + Mo. PMI	$ <u>699.39</u>
4.	Hit *"g" & "C F j" ("PMT" Key)*	
5.	No. Pmts. W/PMI	<u>99</u>
6.	Hit *"g" & "Nj" ("FV" Key)*	
7.	P&I + Mo. PMI	$ <u>699.39</u>
8.	Hit *"g" & "C F j" ("PMT" Key)*	
9.	No. Pmts. W/PMI	<u>79</u>
10.	Hit *"g" & "Nj" ("FV" Key)*	
11.	P&I W/No PMI	$ <u>660.39</u>
12.	Hit *"g" & "C F j"*	
13.	No. Pmts. W/ No PMI	<u>99</u>
14.	Hit *"g" & "Nj"*	
15.	P&I W/No PMI	$ <u>660.39</u>
16.	Hit *"g" & "C F j"*	
17.	No. Pmts. W/No PMI	<u>83</u>
18.	Hit *"g" & "Nj"*	
19.	This will total the number of payments in a 30-year loan	
20.	Total Payments	<u>360</u>
21.	Hit the *gold "f"* Key &	
	"IRR" ("FV") Key =	<u>0.73%</u>
	(Monthly Interest Rate)	
22.	Multiply X 12 to get the	
	Annual Percentage Rate	<u>8.73%</u>
		APR

ANNUAL PERCENTAGE RATE
The cost of credit as a yearly rate.

$$\frac{8.73}{5} \%$$

"APR" simply shows the rate of return the creditor expects to earn over the life of the loan.

That rate includes the interest rate factored over time as well as the fees the borrowers pay up front.

EXAMPLE:

Interest Rate over term of loan	8%
+	
Fees *borrower* pays and *lender* (not a third party) gets	
=	
APR	8.73%

WORKSHEET FOR COMPUTING THE TRUTH-IN-LENDING DISCLOSURE FIXED RATE LOANS

ANNUAL PERCENTAGE RATE The cost of credit as a yearly rate.	FINANCE CHARGE The dollar amount the credit will cost you.	AMOUNT FINANCED The amount of credit provided on your behalf.	TOTAL OF PAYMENTS The amount you will have paid after you have made all payments as scheduled.
_____% 5	$_____ 4	$_____ 3	$_____ 2

NUMBER OF PAYMENTS	AMOUNT OF PAYMENTS	WHEN PAYMENTS ARE DUE	NUMBER OF PAYMENTS	AMOUNT OF PAYMENTS	WHEN PAYMENTS ARE DUE
_____ _____ 1	_____ __ _____	First Day of Month First Day of Month			

The Hewlett Packard HP12C Financial Calculator was used to compute the TRUTH-IN-LENDING DISCLOSURE, as follows:

1. **NUMBER OF PAYMENTS**
    If the borrower is paying monthly PMI, the lender uses a *"worst-case scenario"*, which requires PMI to be terminated at "mid-point". For a 30-year loan, this would be Year 15, or after 180 months. This means that PMI is collected for the first 180 months of the loan, and no PMI is collected for the last 180 months of the loan.

    Mo. P&I $_____ + MO. PMI $_____ = $_____ X _____ Pmts.= $_____
    Mo. P&I $_____ with NO PMI -------------- = $_____ X _____ Pmts.= $_____

    2. TOTAL OF PAYMENTS $_____

3. **AMOUNT FINANCED**

    A. **LOAN AMOUNT** $_____ LESS B. $_____ = $_____

    B. Items *Borrower* Pays that *Lender* Gets:

Loan Orig. Fee	$_____	Other	$_____
Discount Pts.	_____	_____ Days Int. Adj.	_____
Tax Serv. Fee	_____	First Year PMI	_____
Doc. Prep. Fee	_____	2 Mos. PMI Escrowed	_____
Underwrit. Fee	_____	FHA MIP Up Front	_____
Insp. Fee	_____	2 Mos. MIP Escrowed	_____
Flood Cert.	_____	VA Funding Fee	_____
Courier Fee	_____	TOTAL (B Above)	$_____

4. **FINANCE CHARGE**
    Total of Payment $_____   (No. 2 Above)
    Less Amt. Financed $_____   (No. 3 Above)

    FINANCE CHG. $_____

To compute the APR using the Hewlett Packard HP12C Financial Calculator, use the following formula:

Enter *"AMOUNT FINANCED"* Hit *"CHS"*, *"g"*, & *"C F o"* Key (*"PV"* Key)
(From No. 3 Above)
Enter P&I + Mo. PMI for first 180 Payments Hit *"g"*,& *"C F j"* Key (*"PMT"* Key)
Enter Number of Payments* Hit *"g"* & *"Nj"* key (*"FV"* Key)

*The Hewlett Packard HP12C Financial Calculator is not equipped to compute more than 99 payments at once. Therefore, you must break it down into 99 payments first, then 79 payments remaining for the *first 178 payments including PMI*, then 99 payments first, and 83 payments remaining for the *last 180 payments with no PMI.* as follows:

5. ANNUAL PERCENTAGE RATE

1. *"Amount Financed"* $_____ Hit *"CHS"*, *"g"*, & *"C F o"*

2. P&I + Mo. PMI $_____ Hit *"g"* & *"C F j"*

3. No. Pmts. W/PMI _____ Hit *"g"* & *"Nj"*

4. P&I + Mo. PMI $_____ Hit *"g"* & *"C F j"*

5. No. Pmts. W/PMI _____ Hit *"g"* & *"Nj"*

6. P&I W/No PMI $_____ Hit *"g"* & *"C F j"*

7. No. Pmts. W/ No PMI _____ Hit *"g"* & *"Nj"*

8. P&I W/No PMI $_____ Hit *"g"* & *"C F j"*

9. No. Pmts. W/No PMI _____ Hit *"g"* & *"Nj"*

10. This will total 360 payments in a 30-year loan and 180 payments in a 15-year loan.

11. Hit the *gold "f"* Key & *"IRR"* (*"FV"*) Key = _____% (Monthly Interest Rate)

12. Multiply No. 12 X 12 to get the Annual Rate _____%
                                                                                    APR

ANSWERS TO PROBLEMS IN THE WORKBOOK

Key Strokes - Page 14	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
1. 8.012002 "ENTER"	Display reflects 8.01 (2 decimals)
90 "g" "CHS"	Display reflects 10, 30, 2002 3 - Wed.
2. 8.152002 "ENTER"	Display reflects 8.15
45 "g" "CHS"	Display reflects 9, 29, 2002 7 - Sun.
3. 6.032002 "ENTER"	Display reflects 6.03
7.112002 "g" "EEX"	Display reflects 38 days
4. 9.102002 "ENTER"	Display reflects 9.10
8.072002 "g" "EEX"	Display reflects -34 days

Key Strokes - Page 16	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
100 "ENTER" 100 "+"	Display reflects 200.00
875 "ENTER" 432 "-"	Display reflects 443.00
12 "ENTER" 50 "x"	Display reflects 600.00
1,200 "ENTER 7 "÷"	Display reflects 171.43
10 "ENTER" 8 "x" 2 "÷" 4 "+" 1 "-"	Display reflects 43
500 "ENTER" 10 "-" 20 "+"	Display reflects 510

Key Strokes - Page 19	What the Display Will Reflect
Hit *"f" "CLX"* to clear your calculator	
1. 89,900 "ENTER" 95 "%"	Display reflects 85,405.00 rounded down to 85,400.00
2. 150,000 "ENTER" 90 "%"	Display reflects 135,000.00
3. 159,000 "ENTER" 80 "%"	Display reflects 127,200.00
4. 50,000 "ENTER" 75 "%"	Display reflects 37,500.00
5A. 500 "ENTER" 25 "%"	Display reflects 125.00
5B. 849 "ENTER" 25 "%"	Display reflects 212.25
5C. 763 "ENTER" 25 "%"	Display reflects 190.75
5D. 378 "ENTER" 25 "%"	Display reflects 94.50

Key Strokes - Page 22	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
1. 20,000 "ENTER" 25,000 "Δ%"	Display reflects 25.00
2. 149,000 "ENTER" 145,000 "Δ%"	Display reflects -2.68
3. 800 "ENTER" 24 "%T"	Display reflects 3.00
4. 1,000 "ENTER" 50 "%T"	Display reflects 5.00
5. 50,000 "ENTER" 57,500 "Δ%"	Display reflects 15.00

Key Strokes - Page 24	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
90,000 "ENTER" 95 "%"	Display reflects 85,500 Loan
Hit "-" (Subtract)	Display reflects 4,500 Down Payment
99,000 "ENTER" 90 "%"	Display reflects 89,100 Loan
Hit "-"	Display reflects 9,900 Down Payment
125,000 "ENTER" 90 "%"	Display reflects 112,500 Loan
Hit "-"	Display reflects 12,500 Down Pmt.
142,000 "ENTER" 90 "%"	Display reflects 127,000 Loan
Hit "-"	Display reflects 14,200 Down Pmt.
150,000 "ENTER" 80 "%"	Display reflects 120,000 Loan
Hit "-"	Display reflects 30,000 Down Pmt.
165,000 "ENTER" 80 "%"	Display reflects 132,000 Loan
Hit "-"	Display reflects 33,000 Down Pmt.

Key Strokes - Page 26	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
78,900 "ENTER" 95 "%"	Display reflects 74,955
5 "-" (Subtract) "-" (Subtract)	Display reflects 74,950/3,950
89,900 "ENTER" 90 "%"	Display reflects 80,910
10 "-" "-"	Display reflects 80,900/9,000
93,450 "ENTER" 90 "%"	Display reflects 84,105
5 "-" "-"	Display reflects 84,100/9,350
98,950 "ENTER" 90 "%"	Display reflects 79,160
10 "-" "-"	Display reflects 79,150/19,80
105,200 "ENTER" 80 "%"	Display reflects 84,160
10 "-" "-"	Display reflects 84,150/21,050
126,900 "ENTER" 80 "%"	Display reflects 101,520
20 "-" "-"	Display reflects 101,500/25,400

Key Strokes - Page 31	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
7% Rate:	Display reflects -598.77
360 "n" 7 "g" "i" 90,000 "PV" "PMT"	Display reflects -528.92
79,500 "PV" "PMT"	Display reflects -831.63
125,000 "PV" "PMT"	Display reflects -1,196.88
179,900 "PV" "PMT"	Display reflects -911.13
136,950 "PV" "PMT"	Display reflects -864.23
129,900 "PV" "PMT"	
Switch to 7.5% Rate:	
7.5 "g" "i" 90,000 "PV" PMT"	Display reflects -629.29
79,500 "PV" "PMT"	Display reflects -555.88
125,000 "PV" "PMT"	Display reflects -814.02
179,900 "PV" "PMT"	Display reflects -1,257.89
136,950 "PV" "PMT"	Display reflects -957.57
129,900 "PV" "PMT"	Display reflects -908.28

Key Strokes - Page 34	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
1. 360 "n" 7.5 "g" "i" 95,000 "PV" "PMT"	Display reflects -664.25
50 "CHS" "ENTER", "RCL" "PMT" "+"	
"PMT"	Display reflects -714.25
"n"	Display reflects 286 months
12 "÷"	Display reflects 23.85 years
2. 360 "n" 6.75 "g" "i" 125,000 "PV" "PMT"	Display reflects -810.75
12 "÷"	Display reflects -67.56
"RCL" "PMT" "+" "PMT"	Display reflects -878.31
"n"	Display reflects 288 months
12 "÷"	Display reflects 24.00 years
3. 360 "n" 7.25 "g" "i" 189,900 "PV" "PMT"	Display reflects -1,295.45
20 "g" "n"	Display reflects 240 payments
"PMT"	Display reflects -1,500.92

Key Strokes - Page 39	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 7 "g" "i" 193,600 "PV" PMT" "STO" 1 5 "g" "i" "RCL" 1 "-" (subtract) 12 "x" 6 "g" "i" "RCL" 1 "-" 12 "x" "RCL" 2 "+"	Display reflects -1,288.03 Display reflects -1,039.29 Display reflects 248.74 Display reflects 2,984.87 Display reflects -1,160.79 Display reflects 127.30 Display reflects 1,527.55 Display reflects 4,512.42

Key Strokes - Page 42	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 8.25 "g" "i" 99,900 "PV" PMT" 4.011994 "ENTER" 5.012002 "g" "EEX" 30 "÷" "n" "FV"	Display reflects -750.52 Display reflects 98.40 payments Display reflects -91,569.64
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 7.75 "g" "i" 169,400 "PV" "PMT" 11.011995 "ENTER" 5.012002 "g" "EEX" 30 "÷" "n" "FV"	Display reflects -1,213.60 Display reflects 79.10 payments Display reflects -157,309.77
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 8.125 "g" "i" 186,500 "PV" "PMT" 6.011996 "ENTER" 5.012002 "g" "EEX" 30 "÷" "n" "FV"	Display reflects -1,384.76 Display reflects 72.00 payments Display reflects -175,228.53
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 7.5 "g" "i" 125,000 "PV" "PMT" 3.011997 "ENTER" 5.012002 "g" "EEX" 30 "÷" "n" "FV"	Display reflects -874.02 Display reflects 62.90 payments Display reflects -119,035.97
Hit *"f"* *"CLX"* to clear your calculator 360 "n" 7.25 "g" "i" 156,800 "PV" "PMT" 5.011998 "ENTER" 5.012002 "g" "EEX" 30 "÷" "n" "FV"	Display reflects -1,069.65 Display reflects 48.70 payments Display reflects -150,897.77

Key Strokes - Page 47	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
360 "n" 7.5 "g" 112,500 "PV" PMT"	Display reflects -786.62
1 "f" "n"	Display reflects -703.13 interest
"x/y"	Display reflects -83.49 principal
"RCL" "PV"	Display reflects 112,416.51
1 "f" "n"	Display reflects -702.60 interest
"x/y"	Display reflects -84.02 principal
"RCL" PV"	Display reflects 112,332.49
1 "f" "n"	Display reflects -702.08 interest
"x/y"	Display reflects -84.54 principal
"RCL" PV"	Display reflects 112,247.95
1 "f" "n"	Display reflects -701.55 interest
"x/y"	Display reflects -85.07 principal
"RCL" PV"	Display reflects 112,162.88
1 "f" "n"	Display reflects -701.02 interest
"x/y"	Display reflects -85.60 principal
"RCL" PV"	Display reflects 112,077.28

Key Strokes - Page 51	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
1. 360 "n" 7 "g" "i" 98,000 "PV" "PMT"	Display reflects -652.00
60 "n" "FV"	Display reflects -92,248.96
Hit *"f"* *"CLX"* to clear your calculator	
2. 30 "ENTER" 4 "x" "n"	Display reflects 120 payments
7.25 "ENTER" 4 "÷" "i"	Display reflects 1.81 quarterly rate
143,000 "PV" "PMT"	Display reflects -2,931.46 payment
5 "ENTER" 4 "x" "n"	Display reflects 20.00 payments
"FV"	Display reflects -134,901.22

Key Strokes - Page 51 (Cont'd)	What the Display Will Reflect
Hit *"f"* *"CLX"* to clear your calculator	
3.　30 "ENTER" 24 "x" "n"	Display reflects 720 payments
7.50 "ENTER" 24 "÷" "i"	Display reflects 0.31 bi-mo. rate
95,000 "PV" PMT"	Display reflects -331.99 payment
5 "ENTER" 24 "x" "n"	Display reflects 120.00 payments
"FV"	Display reflects -89,897.00
Hit *"f"* *"CLX"* to clear your calculator	
4.　30 "n"	Display reflects 30 payments
7.75 "i"	Display reflects 7.75 annual rate
135,000 "PV" "PMT"	Display reflects -11,709.99
5 "n"	Display reflects 5 payments
"FV"	Display reflects -127,717.85