



hp calculators

HP 49G+ House Payment Qualification

The FINANCE menu

House Payment Qualification

Practice solving house payment qualification problems



The FINANCE menu

The Finance solver is accessed from the GREEN shifted function of the $\boxed{9}$ key by pressing $\boxed{\leftarrow}$ **FINANCE**. When pressed, a data entry form is displayed that is used to solve a number of financial math problems.

TIME VALUE OF MONEY

N: 0 I/YR: 0

PV: 0.00

PMT: 0.00 P/YR: 12

FV: 0.00 End

Enter no. of payments or SOLVE

EDIT AMOR SOLVE

Figure 1

To solve problems using this display, move the cursor using the $\boxed{\leftarrow}$ $\boxed{\downarrow}$ $\boxed{\uparrow}$ $\boxed{\rightarrow}$ keys to each field and input its value, if known. To solve for the unknown value, move the cursor to the field for which you wish to solve, and press the $\boxed{F6}$ key to register the choice of **SOLVE**, which is displayed above it. The value of the unknown will be calculated and displayed in the field. The solved value of the variable will be copied to the first level of the command stack in case further calculations with it are desired.

Variables will also be created whenever a value is stored in one of the financial fields or when it has been solved. These variables (N for example holds the value for n) can be seen in the \boxed{VAR} menu. When they are no longer needed, they can be deleted just like any other user-created variables. Values from a previous use of the financial solver remain until the variables holding them are deleted.

Several values are already present on this screen. The number of payments per year is set to 12 for monthly compounding, as shown to the right of the P/YR: in the screen above. If annual compounding is desired, this value should be changed to 1. If quarterly compounding is desired, this value should be changed to 4. Just below the P/YR: field, the calculator displays the word **END**, signifying that payments are assumed to occur at the end of each period, which would be the case for ordinary annuities. If payments are desired at the beginning of the period, as would be the case in an annuity due, this value can be changed by moving the cursor to this field. When the cursor is on this field, **CHOOSE** is displayed above the $\boxed{F2}$ key, indicating the calculator will supply a list of choices (Begin or End) in a small CHOOSE box if this key is pressed. Note that Begin will be displayed as Beg if chosen. To exit from this data entry screen, press the \boxed{ON} key.

TIME VALUE OF MONEY

N: 0 I/YR: 0

PV: 0.00

PMT: 0.00 P/YR: 12

FV: 0.00 End

Choose when payments are made

CHOOSE AMOR

Figure 2

The HP 49G+ Financial solver follows the standard convention that money in is considered positive and money out is negative.

House payment Qualification

The payment required to pay off a house over time involves the solution of an ordinary annuity with the value of the payment as the unknown variable. When applying for a house loan or mortgage, the lender takes the applicant's debt burden into account. A general guideline applied is that the total debt to income should be below 34% and that the house payment plus taxes and insurance should be below 27% of total income. If a house payment composed of principal and interest were \$900, monthly taxes and insurance might add an additional \$100 a month or more to this payment. This will determine the maximum house payment for which an applicant may qualify as well as the corresponding maximum loan amount.

Practice solving for house payment qualification problems

Example 1: Richard wants to buy a house that costs \$170,000 using a 30 year loan at 6% compounded monthly. His annual income is \$55,000. His existing monthly debt includes a car payment of \$295 per month and a minimum payment on his credit card of \$25 per month. Property taxes are estimated at \$1,300 per year and the annual insurance premium is estimated at \$450 per year. Can Richard qualify for this house loan if the lender applies the 27%/34% guidelines?

Solution: Assumes RPN mode. Richard's monthly income is \$55,000 divided by 12, or \$4,583.33 (if you see a fraction of 13750/3 in the display, press \rightarrow \rightarrow NUM to convert to a number.)

5 5 0 0 0 ENTER 1 2 \div

The maximum house payment (including taxes and insurance) Richard can qualify for is 27% of his monthly income, or \$1,237.50

0 . 2 7 \times

The required payment on the house is found by the following:

\leftarrow FINANCE 3 6 0 ENTER 6 ENTER 1 7 0 0 0 0 ENTER \rightarrow 1 2 ENTER
0 ENTER \leftarrow Δ SOLVE

```

TIME VALUE OF MONEY
n: 360      I/YR: 6
PV: 170,000.00
PMT: -1,019.24  P/YR: 12
FV: 0.00      End
Enter payment amount or SOLVE
EDIT  AMOR  SOLVE

```

Figure 3

The house payment is \$1,019.24 a month. With taxes and insurance, this increases to \$1,165.07

ON

```

RAD XYZ HEX R= 'X'
<HOME>
5:
4:
3:
2:
1: PMT:(-1019.23589276'
EDIT VIEW STACK RCL PURGE CLEAR

```

Figure 4

1 3 0 0 ENTER 4 5 0 + 1 2 \div \rightarrow \rightarrow NUM with \rightarrow \rightarrow NUM if a fraction is displayed.

```

RAD XYZ HEX R= 'X'
<HOME>
5:
4:
3:
2:
1: -1165.06922609
EDIT VIEW STACK RCL PURGE CLEAR

```

Figure 5

The \$1,165.07 is the total monthly house payment plus taxes and insurance. Richard's total monthly debt is to be less than 34% of his monthly income. The maximum monthly debt Richard can have is 34% of his monthly income, or \$1,558.33

5 5 0 0 0 ENTER 1 2 \div 0 . 3 4 \times with \rightarrow \rightarrow NUM if a fraction is displayed

```

RAD XYZ HEX R= 'X'
<HOME>
5:
4:
3:
2: -1165.06922609
1: 1558.33333333
EDIT VIEW STACK RCL PURGE CLEAR

```

Figure 6

Richard's total debt would be the \$1,165.07 house payment, the \$295 car payment and the \$25 per month

credit card payment. This is a total of \$1,485.07, which is less than the maximum monthly debt limit set by the 34% guideline. Note that the \blacktriangleright key below will swap the order of the two numbers displayed.

\blacktriangleright $\frac{1}{x}$ 2 9 5 + 2 5 +

```

RAD XYZ HEX R= 'X'
[HOME]
5:
4:
3:
2: 1558.333333
1: 1485.069226
[EDIT] [VIEW] [STACK] [RCL] [PURGE] [CLEAR]

```

Figure 7

Answer: Richard can qualify for this house loan because he meets the 27%/34% guidelines.

Example 2: Caroline wants to buy a house that costs \$208,000 using a 15 year loan at 5% compounded monthly. Her annual income is \$75,000. Her existing monthly debt includes a car payment of \$365 per month and minimum payments on her credit card of \$96.50 per month. Property taxes are estimated at \$1,900 per year and the annual insurance premium is estimated at \$1,150 per year. Can Caroline qualify for this house loan if the lender applies the 27%/34% guidelines?

Solution: Assumes Algebraic mode. Caroline's monthly income is \$75,000 divided by 12, or \$6,250.

7 5 0 0 0 ÷ 1 2 [ENTER]

The maximum house payment (including taxes and insurance) Caroline can qualify for is 27% of her monthly income, or \$1,687.50

× 0 . 2 7 [ENTER]

The required payment on the house is found by the following:

\leftarrow FINANCE 1 8 0 [ENTER] 5 [ENTER] 2 0 8 0 0 0 0 [ENTER] \blacktriangleright 1 2 [ENTER]
0 [ENTER] \leftarrow Δ \square

```

TIME VALUE OF MONEY
n: 180      I/YR: 5
PV: 208000.00
PMT: -1644.85 P/YR: 12
FV: 0.00      End
Enter payment amount or SOLVE
[EDIT] [ ] [ ] [ ] [AMOR] [SOLVE]

```

Figure 8

The house payment is \$1,644.85 a month. With taxes and insurance, this increases to \$1,899.02

ON

```

RAD XYZ HEX R= 'X'      ALG
[HOME]
12
I 6250
:ANS(1).27
1687.5
PMT: (-1644.85074362
[EDIT] [VIEW] [STACK] [RCL] [PURGE] [CLEAR]

```

Figure 9

$\frac{1}{x}$ \leftarrow ANS + \leftarrow () 1 9 0 0 + 1 1 5 0 \blacktriangleright ÷ 1 2 [ENTER]
with \rightarrow NUM [ENTER] if a fraction is displayed.

```
RAD XYZ HEX R= 'X'      ALG
[HOME]
      = 12
      1644.85074362 + 1525
                      6
      :→NUM(ANS(1))
      1899.01741025
[EDIT][VIEW][STACK][RCL][PURGE][CLEAR]
```

Figure 10

The \$1,899.02 is the total monthly house payment plus taxes and insurance. This is larger than the 27% guideline previously computed.

Answer: Caroline cannot qualify for this house loan because she does not meet the 27% guideline. Perhaps she should consider a 30 year loan.