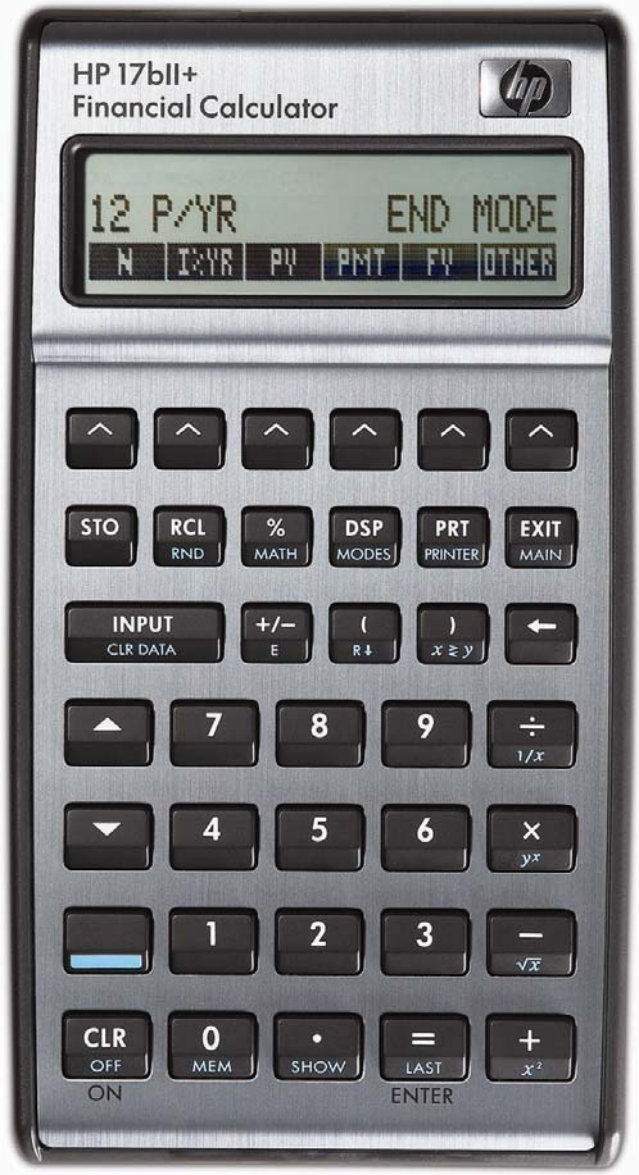
hp calculators

HP 17bII+ Solving for loan payments

The time value of money application

Loan payments

Practice solving for loan payments



The time value of money application

The time value of money application built into the HP 17bII+ is used to solve compound interest problems and annuities that involve regular, uniform payments. This application is accessed from the main menu level of the HP 17bII+ by pressing [FIN] then [TVM]. Note that to access these menus, you must press the appropriate [^] key just below the symbols on the screen. If you do not see [FIN] displayed on the screen, you may be inside a different menu. You can return to the main menu and select the [FIN] menu by pressing [EXIT MAIN].

When you enter the TVM environment for the first time, the screen will appear as shown in Figure 1 below.

Figure 1

Compound interest problems require the input of 3 of these 4 values: [N] [I%YR] [PV] [FV]. Annuity problems require the input of 4 of these 5 values: [N] [I%YR] [PV] [PMT] [FV]. Once these values have been entered in any order, the unknown value can be computed by pressing the key for the unknown value.

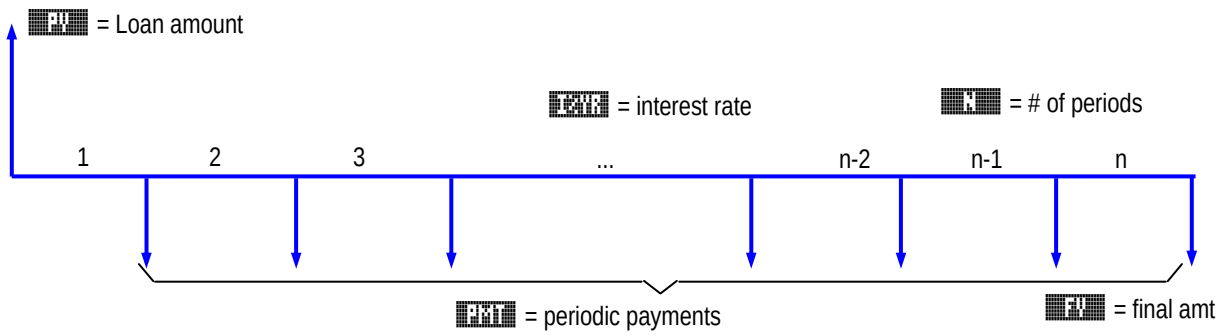
Interest rates are always entered as the number is written in front of the percent sign, i.e., 5% is entered as a 5 rather than as 0.05. Values for N are always the total number of periods – if a problem has an interest rate that is compounded monthly and the time frame is 5 years, the value entered for N would be 60 total periods. Additional information can be found in the learning module covering time value of money basics.

Loan payments

Nearly everyone makes loan payments at one time or another, since few of us are able to always pay cash for houses and cars. Loan payments are computed so that part of the payment made pays for interest that has accrued on the loan since the last payment and part goes toward reducing the outstanding loan balance. Over the life of the loan, the portion of each payment that goes toward interest and the outstanding loan balance (or principal) changes, with the portion of each payment going toward principal increasing throughout the lifetime of the loan. This aspect of a loan is explained in greater detail in the learning module on loan amortizations.

Cash flow diagrams and sign conventions

The sign conventions for cash flows in the HP 17bII+ follow this simple rule: money received is positive (arrow pointing up), money paid out is negative (arrow pointing down). The key is keeping the same viewpoint through each complete calculation. The regular use of cash flow diagrams allows a faster approach to solve most TVM-related problems. The cash flow diagram below represents the borrower viewpoint of the most problems and their relationship to the TVM variables.



Practice solving for loan payments

NOTE: Once you begin working these problems, the keystrokes shown assume you do not leave the TVM menu environment. Should you leave that environment and then decide to work a problem below other than Example 1, you should press EXIT TVM to return to the TVM environment.

Example 1: Johnny wants to buy a house that costs $180,000 and pay for it with a 30-year loan at 6% interest, compounded monthly. What is the size of Johnny's monthly house payment?

Solution: EXIT TVM INPUT
OTHER 1 2 P/YR EXIT
3 6 0 MEM N
6 I%YR
1 8 0 0 0 0 0 MEM PV
PMT

Figure 2

Answer: $-1,079.19.

Example 2: Sarah is considering buying a car that costs $24,995. The terms she has been offered are a 36-month loan at 4.9%. What would be the size of her monthly car payment?

Solution: INPUT
3 6 N
4 • 9 I%YR
2 4 9 9 5 PV
PMT

Figure 3

Answer: $-748 per month. Sarah might want to see if there are cheaper alternatives.

Example 3: Sarah is considering buying a car that costs $24,995. Since she felt the car payment in Example 2 was a little high each month, she shopped around and found a bank that would finance the car for 72 months at 2.9%. What would be the size of her monthly car payment?

Solution: INPUT
7 2 N
2 • 9 I%YR
2 4 9 9 5 PV
PMT

Figure 4

Answer: $-378.65 per month. That might fit more easily into Sarah's budget.

Example 4: Fred owes Tony $2,500. Fred agrees to pay Tony $400 now and to pay off the remainder of the debt with monthly payments over the next 12 months. If they agree that interest should be assessed at 9%, compounded monthly, what payment would Fred make each month? (Note: The solution is shown in algebraic mode).

Solution:

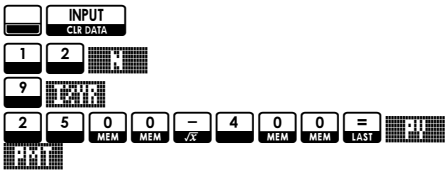


Figure 5

Answer: $-183.65 per month.

Example 5: Terry just bought his girlfriend an engagement ring that cost $4,000. If he pays 5% as a down payment and finances the remaining balance at 7.5%, compounded monthly over 24 months, what is the size of the monthly payment Terry will be making?

Solution:

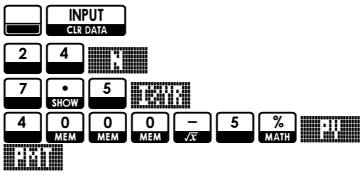


Figure 6

Answer: $-171 per month.

Example 6: Heather and Howard are buying a house that costs $250,000. They must pay 20% down and can finance the remaining amount over 15 years at 5.65%, compounded monthly. What is the size of their monthly payment?

Solution:

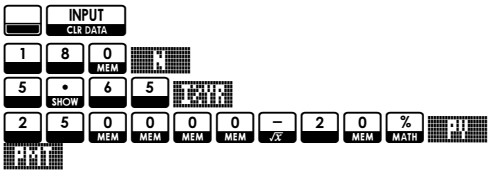


Figure 7

Answer: $-1,650.13 per month.