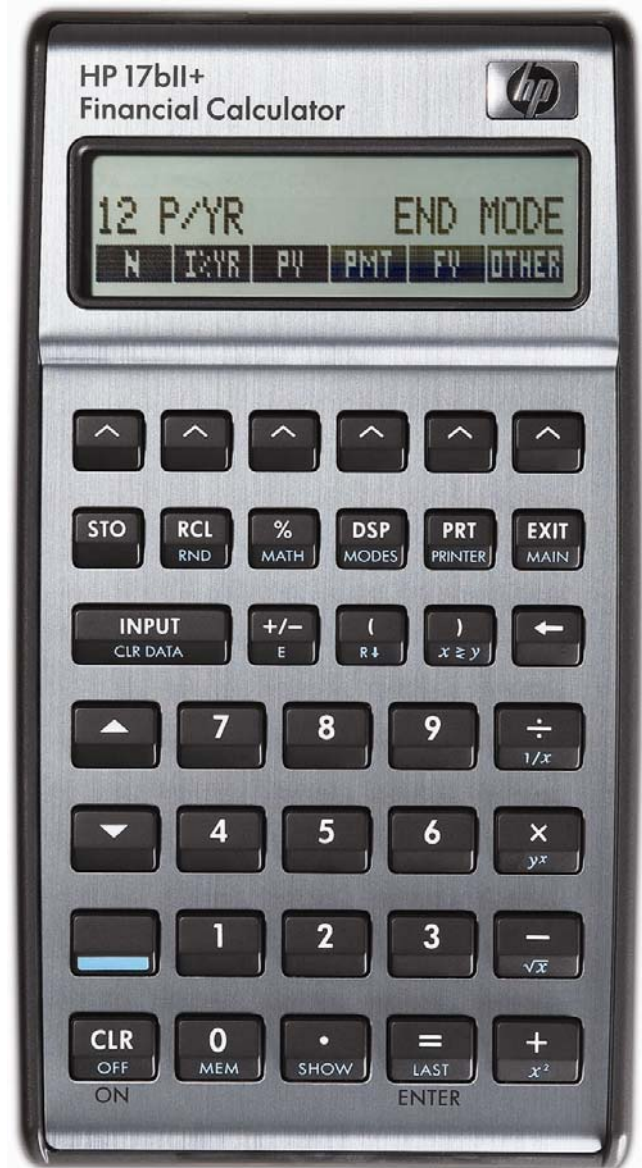# hp calculators

HP 17bII+ Solving for lease payments

The time value of money application

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Lease payments

Practice solving for the payment on a lease

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 ▦▦▦ then ▦▦▦. Note that to access these menus, you must press the appropriate ⌃ key just below the symbols on the screen. If you do not see ▦▦▦ displayed on the screen, you may be inside a different menu. You can return to the main menu and select the ▦▦▦ 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.

```
12 P/YR        END MODE
 N | I%YR | PV | PMT | FV |OTHER
```
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.

Special settings

There are several settings that affect the operation of the time value of money application.

Clearing the time value of money registers. The 5 storage registers that hold the time value of money values, ▦N▦ ▦I%YR▦ ▦PV▦ ▦PMT▦ ▦FV▦ , are cleared when ▭ INPUT CLR DATA is pressed when the calculator is showing the TVM menu.

Begin/End Mode. A special mode setting relates to the solution of problems known as annuities. This mode tells the HP 17bII+ to solve these problems assuming that payments are made either at the beginning of a period or at the end of a period, which is why this mode is called Begin / End mode. The default mode is END as shown in Figure 2.

```
12 P/YR        END MODE
 N | I%YR | PV | PMT | FV |OTHER
```
Figure 2

This mode is changed by pressing ▦OTHER▦ from the main TVM menu and then choosing ▦BEG▦ or ▦END▦. To return to the previous page of the TVM menu, press EXIT MAIN .

If you receive an unexpected result when solving an annuity problem, make sure that the calculator is in the proper mode and try resolving the problem.

Lease payments

A lease is an agreement for one company or individual to use an asset owned by another company or individual for a specified time. The payment required (often called the "rent") during this lease period depends upon the interest rate involved and the decline in value the asset with experience while being used. The projected value of the asset at the end of the period is often called the residual value. Lease payments are usually made in advance, which requires them to be treated as annuities due. For the HP 17bII+ to solve problems involving leases or annuities due, it must be in Begin mode, as described above.

Note that it may also be difficult to determine the actual interest rate involved in a lease. The examples below assume this interest rate is known.

Practice solving for the payment on a lease

Example 1:   A company is considering leasing a machine that costs $20,000 today. The lease would be for 5 years with a residual value of $6,000 for the machine at the end of that period. The agreement calls for the use of an 8%, compounded monthly, interest rate. If monthly lease payments will be made, what is the size of the lease payment required?

Solution: To solve this leasing problem, the calculator will need to be in Begin mode. Remember to change the calculator back to End mode before solving ordinary annuities again.
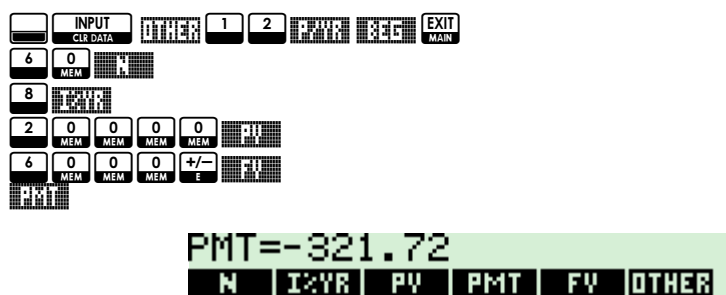

PMT=-321.72

Figure 3

Answer: $-321.72

Example 2:   An individual is considering leasing a car that costs $26,995 today. The lease would be for 2 years with a residual value of $14,000 for the vehicle at the end of that period. The agreement calls for the use of a 6%, compounded monthly, interest rate. If monthly lease payments will be made, what is the size of the lease payment required?

Solution: To solve this leasing problem, the calculator will need to be in Begin mode. Remember to change the calculator back to End mode before solving ordinary annuities again.
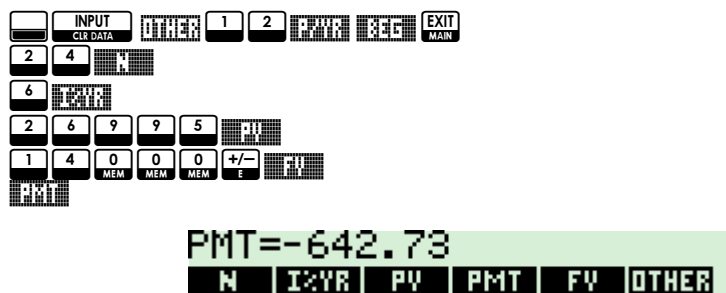

PMT=-642.73

Figure 4

Answer: $-642.73

Example 3:   A company is considering leasing a machine that costs $24,505 today. The lease would be for 3 years with a residual value of $11,000 for the machine at the end of that period. The agreement calls for the use of a 10%, compounded monthly, interest rate. If monthly lease payments will be made, what is the size of the lease payment required?

HP 17bII+ Solving for lease payments

Solution: To solve this leasing problem, the calculator will need to be in Begin mode. Remember to change the
               calculator back to End mode before solving ordinary annuities again.
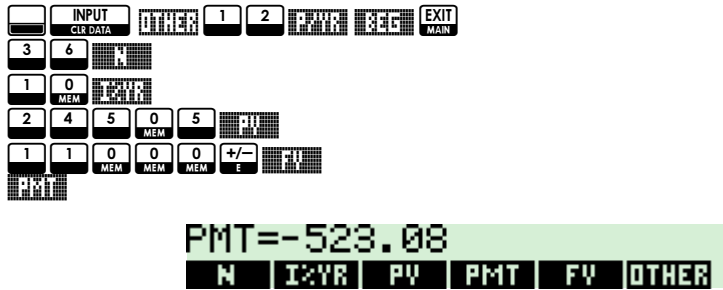
PMT=-523.08

Figure 5

Answer: $523.08