



hp calculators

HP 10BII Solving for lease payments

The time value of money application

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 10BII is used to solve annuities that involve regular, uniform payments. 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.

The time value of money application operates on the convention that money invested is considered positive and money withdrawn is considered negative. In a compound interest problem, for example, if a positive value is input for the PV , then a computed FV will be displayed as a negative number. In an annuity problem, of the three monetary variables, at least one must be of a different sign than the other two. For example, if the PV and PMT are positive, then the FV will be negative. If the PV and FV are both negative, then the PMT must be positive. An analysis of the monetary situation should indicate which values are being invested and which values are being withdrawn. This will determine which are entered as positive values and which are entered as negative values.

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.

The number of periods per year is set using the yellow-shifted P/YR function. Problems involving annual compounding or annual payments should be solved with this value set to 1. Problems involving monthly compounding or monthly payments should be solved with this value set to 12. To set this value to 4 for quarterly payments / quarterly compounding, for example, you would press 4 \blacksquare P/YR .

Additional information can be found in the learning module covering time value of money basics.

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 10BII to solve problems involving leases or annuities due, it must be in Begin mode.

This mode is set using the yellow-shifted BEG/END function, located above the MAR key, or \blacksquare BEG/END . This function will change the mode from whatever mode the calculator is presently in to the other mode – it will cycle through the modes if pressed repeatedly. When the HP 10BII is in Begin mode, the word BEGIN will show in the display.

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.



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

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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. The solution below assumes the HP10BII calculator is not already in this mode. If the calculator is already in this mode, the keystrokes of   shown below may be omitted. Remember to change the calculator back to End mode before solving ordinary annuities again.

```






  C ALL
  BEG/END
1 2  P/YR
6 0 N
8 I/YR
2 0 0 0 0 PV
6 0 0 0 0 +/- FV
PMT
    
```

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. The solution below assumes the HP10BII calculator is not already in this mode. If the calculator is already in this mode, the keystrokes of   shown below may be omitted. Remember to change the calculator back to End mode before solving ordinary annuities again.

```

  C ALL
  BEG/END
1 2  P/YR
2 4 N
6 I/YR
2 6 9 9 5 PV
1 4 0 0 0 +/- FV
PMT
    
```

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 an 10%, 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. The solution below assumes the HP10BII calculator is not already in this mode. If the calculator is already in this mode, the keystrokes of   shown below may be omitted. Remember to change the calculator back to End mode before solving ordinary annuities again.

☐ C ALL
☐ BEGEND
1 2 ☐ P/YR
3 6 N
1 0 I/YR
2 4 5 0 5 PV
1 1 0 0 0 +/- FV
PMT

Answer: \$532.08