

TI 83 and TI 83 Plus Tutorial

By default the TI 83 displays only two decimal places. To change the display, press the Mode key, then the down arrow key to the Float line. Next, use the right arrow key to highlight the number of decimal places desired (4 is a good choice) and press Enter. Finally, press 2nd and Quit to exit the menu.

Before entering data for any type of financial problem, you must go to the finance functions page. For the TI-83, press 2nd then FINANCE. On the TI 83 Plus, press the Apps button, and then choose the Finance menu.

To solve a lump sum or annuity problem you choose 1: TVM Solver from the finance function menu. (Either highlight 1:TVM Solver and then press Enter, or just enter 1.) You will now see in your screen a series of items you are able to enter (N, I%, PV, PMT, FV, P/Y, C/Y). All lump sum and annuity problems require that you enter the data given by using the arrow keys to place the cursor next to the items you know and typing the value. Make sure all items that are not used in the problem are set equal to zero. After entering the data you are given, move the cursor to the item you wish to solve and press Alpha and then Enter.

NOTES:

- (1) The calculators by default treat PV as a negative number (cash outflow). Therefore, it is a good idea to enter all PV's as negative numbers. On these calculators you enter a negative number by first pressing the sign change key “(-)” and entering the number value.)
- (2) Make sure the values for P/Y and C/Y are set equal to 1.

EXAMPLES:

(A) calculate PV

What is the present value of \$2000 received 10 years from now if the interest rate you could have received is 7%?

First enter the information that is given.

$$N = 10$$

$$I\% = 7$$

$$P\% =$$

$$PMT = 0$$

$$FV = 2000$$

To solve the problem, place the cursor beside PV and press Alpha and then solve.

Answer: \$1016.70 (The answer will appear with a negative sign.)

(B) calculate FV

What is the future value 10 years from now of \$2000 deposited today in an account which has a quoted annual interest rate of 10% with quarterly compounding of interest?

First enter the information that is given.

(For the calculated values, be sure to press the enter key so the answer is calculated.)

$N = 10 \times 4$ (This indicates 10 years times 4 interest payments per year.)

$I\% = 10/4$ (This indicates 2.5% per quarter.)

$PV = -2000$ (The negative sign is a result of the calculator's default programming.)

$PMT = 0$

$FV =$

To solve the problem, place the cursor beside FV and press Alpha and then solve.

Answer: \$5370.13

(C) calculate i

What annual interest rate must you earn if you plan to deposit \$10,000 in the bank today and you want it to grow to be \$17,623.42 in 5 years?

First enter the information that is given.

$N = 5$

$I\% =$

$PV = -10000$ (The negative sign is a result of the calculator's default programming.)

$PMT = 0$

$FV = 17623.42$

To solve the problem, place the cursor beside I% and press Alpha and then solve.

Answer: 12%

(D) calculate n

If you deposit \$5000 in an account which earns 9% per year, how many years will it take for the investment to grow to be worth \$10,000?

First enter the information that is given.

$N =$

$I\% = 9$

$PV = -5000$ (The negative sign is a result of the calculator's default programming.)

$PMT = 0$

$FV = 10000$

To solve the problem, place the cursor beside N and press Alpha and then solve.

Answer: 8.0432 years

Your calculator allows you to solve for the various items for an **ordinary annuity or an annuity due**. You must make sure the calculator is in the correct "mode" for the type of annuity you are considering. The calculator has two annuities modes: END and BEGIN. The "BEGIN" mode is used for an annuity due (begin means the payments are at the beginning of the period). The "END" mode is used for ordinary annuities (end means the payments are at the end of the period). The calculator is using the mode that is highlighted. To change modes, use the arrow keys to highlight the correct mode and then press enter.

EXAMPLE:

You are offered an investment that will pay you \$5000 per year for the next 10 years. Each payment will be made at the end of each year. If the appropriate discount rate is 9% per year, what is the present value of the annuity?

First enter the information that is given.

$$N = 10$$

$$I\% = 9$$

$$PV =$$

$$PMT = 5000$$

$$FV = 0$$

NOTE: Make sure you are in the END mode.

To solve the problem, place the cursor beside PV and press Alpha and then solve.

Answer: \$32,088.29

EXAMPLE:

You are offered an investment that will pay you \$8000 per year for the next 20 years. Each payment will be made at the beginning of each year. If you expect to earn an annual return of 7% per year, what is the future value of the annuity at the end of the 20 years?

First enter the information that is given.

$$N = 20$$

$$I\% = 7$$

$$PV = 0$$

$$PMT = 8000$$

$$FV =$$

NOTE: Make sure you are in the BEGIN mode.

To solve the problem, place the cursor beside FV and press Alpha and then solve. Answer:
\$350,921.41

Uneven Cash Flows

The TI 83 requires a correct input format to calculate the present value of uneven cashflows. To find the present value of an uneven stream of cash flows, we need to use the NPV function. You access the NPV function by going to the finance menu and choosing option number 7. This function is defined as:

$\text{NPV}(\text{Rate}, \text{Initial Outlay}, \{\text{Cash Flows}\}, \{\text{Cash Flow Frequencies}\})$

Rate is the interest rate per period. Initial Outlay indicates what happens now (today). {Cash Flows} are the future cash flow amounts. Enter the cash flows in braces separated by commas. {Cash Flow Frequencies} are the number of times each cash flow occurs. They are also entered in braces separated by commas. Note that the {Cash Flow Frequencies} are needed only if there are cash flows of equal amounts that occur multiple times.

Example:

Suppose that you are offered an investment which will pay \$100 at the end of the first year, \$200 at the end of the second year, \$300 at the end of the third year, \$400 at the end of the fourth year, and \$500 at the end of the fifth year. How much are the cash flows worth in today's dollars if your annual required rate of return is 12%?

To solve the problem, go to the finance function menu and choose option 7:npv(. The screen will show npv(when you choose option 7. You now enter the information given based on the format listed above.

$\text{npv}(12,0,\{100,200,300,400,500\})$ and then press "ENTER." ANSWER: \$1000.18

12 is your interest rate. 0 is the initial outlay (cash flow zero) since nothing happens now. The future cash flows are entered in braces in order of occurrence separated by commas. The cash frequencies are not needed since all cash flows occur only one time.

If there are multiple cash flows we need the cash flow frequencies.

Example:

Suppose that you are offered an investment that at the end of each year will pay \$500 for the first 5 years, \$1500 for the next 10 years, and \$2500 for the next 15 years. What is the present value of the cash flows if your annual required rate of return is 13%?

To solve the problem, go to the finance function menu and choose option 7:npv(. The screen will show npv(when you choose option 7. You now enter the information given based on the format listed above.

$\text{npv}(13,0,\{500,1500,2500\},\{5,10,15\})$ and then press "ENTER." ANSWER: \$8759.52

13 is your interest rate. 0 is the initial outlay (cash flow zero) since nothing happens now. The future cash flow are entered in braces in order of occurrence separated by commas. Note that you only enter each "different" cash flow. The cash flow frequencies are entered in the same order as the corresponding cash flows to indicate how many times you receive each of the "different" cash flows.