

Financial Capabilities of the TI-83, TI-83+, TI-84+

TI-83: 2^{nd} FINANCE , above x^{-1} → TVM Solver .	TI-83 Plus and TI-84 Plus: APPS → Finance → TVM Solver .
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General instructions on the use of the **FINANCE** aspect of the calculator:

- **N** means the total number of compounding periods (e.g., compounding monthly for 5 years means $N = 60$).
- **I%** is the interest rate. It is not entered as the decimal equivalent (e.g., 6% is entered as 6, not as .06).
- **PV** is present value, and it will always be *positive*.
- **PMT** is the dollar amount of the payment.
 - **PMT** is entered as a *positive* number when the account balance is *increasing*.
 - **PMT** is entered as a *negative* number when the account balance is *decreasing*.
- **FV** is future value, and it will always be *negative* (if it is not zero).
- **P/Y** is the number of payments per year (e.g., if payments are made monthly, $P/Y = 12$).
- **C/Y** is the number of compoundings per year (e.g., monthly compounding means $C/Y = 12$).
- **PMT: END BEGIN**, at the bottom of the screen, refers to when a payment is made – at the *beginning* of the compounding period or the *end* of the compounding period.

SOLVE:

When all of the *known* information has been entered, **place the cursor on the unknown**, and then press **ALPHA** and **SOLVE** (which is located in green above the ENTER button).

The following examples are from Steve Wilson's Business Math textbook.

1. Dawn inherits \$5000 from her Uncle Jim. She deposits it into a savings account earning 6% interest compounded monthly. What will be the account balance in 20 years?

$$N = 20 \times 12$$

$$I\% = 6$$

$$PV = 5000$$

$$PMT = 0$$

$$FV = \blacksquare$$

$$P/Y = 12$$

$$C/Y = 12$$

$$PMT: \text{ END BEGIN (Either one will work)}$$

Result for FV: \$16,551.02. This number will show as a negative.

2. Frank wants to have one million dollars at the end of 30 years. How much does he need to deposit today in a savings account earning 7.25% interest compounded quarterly in order to meet his goal?

$$N = 30 \times 4$$

$$I\% = 7.25$$

$$PV = \blacksquare$$

$$PMT = 0$$

$$FV = -1,000,000$$

$$P/Y = 4$$

$$C/Y = 4$$

$$PMT: \text{ END BEGIN (Either one will work)}$$

Result for PV: \$115,842.47

3. How long will it take a \$5000 deposit to grow to \$8000, when interest is 9% compounded monthly?

$$N = \blacksquare$$

$$I\% = 9$$

$$PV = 5000$$

$$PMT = 0$$

$$FV = -8000$$

$$P/Y = 12$$

$$C/Y = 12$$

$$PMT: \text{END BEGIN (Either one will work)}$$

Result for N: 62.9 periods. Then divide by 12 to get 5.24 years.

4. A deposit of \$1200 grew to \$3300 over 20 years, as interest was compounded semiannually. What was the annual interest rate (compounded semiannually) on this investment?

$$N = 20 \times 2$$

$$I\% = \blacksquare$$

$$PV = 1200$$

$$PMT = 0$$

$$FV = -3300$$

$$P/Y = 2$$

$$C/Y = 2$$

$$PMT: \text{END BEGIN (Either one will work)}$$

Result for I%: 5.12%

5. Beatrice deposits \$75 at the end of each month into an account earning 7.75% compounded monthly. How much will the account hold after eight years?

$$N = 8 \times 12$$

$$I\% = 7.75$$

$$PV = 0$$

$$PMT = 75$$

$$FV = \blacksquare$$

$$P/Y = 12$$

$$C/Y = 12$$

$$PMT: \text{END}$$

Result for FV: \$9931.66. This number will show as a negative.

6. Frances wants to have a \$12,000 down payment for a house in three years. How much would she need to deposit at the beginning of each month in an account earning 7% compounded monthly, in order to meet her goal?

$$N = 3 \times 12$$

$$I\% = 7$$

$$PV = 0$$

$$PMT = \blacksquare$$

$$FV = -12,000$$

$$P/Y = 12$$

$$C/Y = 12$$

$$PMT: \text{BEGIN}$$

Result for PMT: \$298.78

7. Ingrid's car loan stipulates payments of \$299 per month for 60 months. The car was originally priced at \$13,500. What is the Annual Percentage Rate?

N = 60
I% = ■
PV = 13,500
PMT = -299
FV = 0
P/Y = 12
C/Y = 12
PMT: END

Result for I%: 11.81%

8. Victoria borrowed \$4,000 at 8.5% interest, and is paying back \$40 each month. How long will it take Victoria to pay off the balance?

N = ■
I% = 8.5
PV = 4000
PMT = -40
FV = 0
P/Y = 12
C/Y = 12
PMT: END

Result for N: 174.6. Divide this number by 12 to get 14 years 7 months.

9. Karl and Karen take out a \$108,000 mortgage to purchase their new home. The interest rate is 7.12% and the term is 30 years. What is the monthly payment?

N = 30 x 12
I% = 7.12
PV = 108,000
PMT = ■
FV = 0
P/Y = 12
C/Y = 12
PMT: END

Result for PMT: \$727.25. This number will show as a negative.

10. Alicia earns \$25,000 per year. She takes 7.65% of her gross monthly salary and invests it at the end of each month into an account earning 5.25% compounded monthly. After 45 years, she retires, and makes monthly withdrawals at the rate of \$25,000 per year. How long will her withdrawals last?

The first step is to find the amount of the monthly investment: $\frac{25,000 \times .0765}{12}$

N = 45 x 12
I% = 5.25
PV = 0
PMT = 159.38
FV = ■
P/Y = 12
C/Y = 12
PMT: END

Result for FV: \$348,373.40. This number will show as a negative.

The first step in the **withdrawal** process is to find the amount of the monthly withdrawal: $\frac{25,000}{12} = 2083.33$

N = ■

I% = 5.25

PV = 348,373.40

PMT = -2083.33

FV = 0

P/Y = 12

C/Y = 12

PMT: END

Result for N: 301.28. Divide this number by 12 to get 25.1 years.