

**Compound Interest**

Simple interest computations always use the starting principal as the basis for calculating the periodic interest. In compound interest computations, the interest from the previous period is added to the current principal and the new total is used as the basis for calculating the interest.

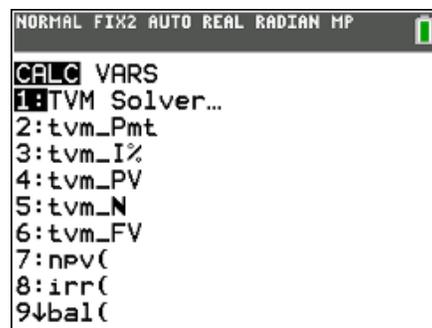
**Objectives:**

- Determine the future value of an investment.
- Determine the amount of money to be invested in order to reach a savings goal in the future.

**Example 1:**

What is the future value of a \$20,000 Certificate of Deposit invested for 5 years at 6% compounded annually?

1. Press **[apps]** and select **Finance**. Press **[enter]** to select **TVM Solver** from the CALC menu.

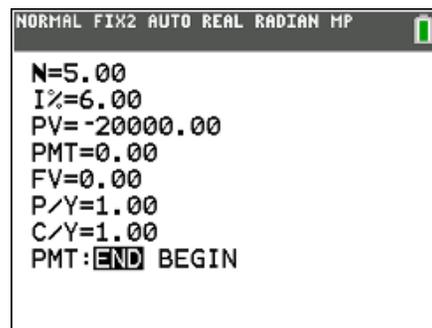


**N** is the number of payment periods, **I%** is the annual interest rate, **PV** is the Present Value, **PMT** is the Payment Amount, **FV** is the Future Value, **P/Y** is the number of payment periods per year, and **C/Y** is the number of compounding periods per year. The last row, **PMT:**, indicates whether payments are made at the end or beginning of each payment period.

**Note:** The mode DECIMAL SETTING was changed to **FIX2** to round computations to two decimal places.

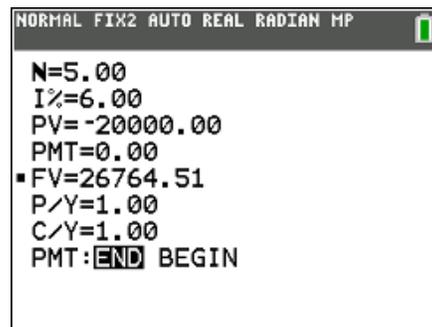
2. For this example, enter N = 5, I% = 6, PV = -20000, PMT = 0, P/Y = 1, and C/Y = 1.

Notice that the money invested, PV, is entered as a negative number because cash outflows are considered negative, while inflows are positive.



3. Place the cursor on the Future Value (FV). Press **[alpha]** **[solve]**. Note the presence of the shaded square before FV, which indicates that FV has been calculated for the given input values.

The future value of the certificate of deposit is \$26,764.51.



**Example 2:**

Tracy invested \$2,000 at 6% compounded quarterly for 5 years. What will his investment be worth in 5 years?

1. Press **apps** and select **Finance**. Press **enter** to select **TVM Solver**.

N is the number of payments. N equals 5 years multiplied by 4 payments per year or 20 payments.  $I\% = 6$  and  $PV = -2000$ . Notice that PV is entered as a negative number because, from Tracy's perspective, the \$2,000 is cash output; it is money leaving his hand. PMT is 0. Payments per year, P/Y, and compounding periods, C/Y, are each 4.

```
NORMAL FIX2 AUTO REAL RADIAN MP
N=20.00
I%=6.00
PV=-2000.00
PMT=0.00
FV=0.00
P/Y=4.00
C/Y=4.00
PMT:END BEGIN
```

2. Move the cursor to FV and then press **alpha** **[solve]** to get \$2,693.71. Note the presence of the shaded square before FV, which indicates that FV has been calculated for the given input values.

```
NORMAL FIX2 AUTO REAL RADIAN MP
N=20.00
I%=6.00
PV=-2000.00
PMT=0.00
■ FV=2693.71
P/Y=4.00
C/Y=4.00
PMT:END BEGIN
```

If N is entered in years (5) rather than payment periods (20), then P/Y should be changed to 1. Ensure that C/Y is 4. This gives the same result for FV, \$2,693.71.

```
NORMAL FIX2 AUTO REAL RADIAN MP
N=5.00
I%=6.00
PV=-2000.00
PMT=0.00
■ FV=2693.71
P/Y=1.00
C/Y=4.00
PMT:END BEGIN
```

**Example 3:**

Find the future value of \$8,000 invested for 6 years at 8% compounded monthly.

Use the **TVM Solver** and enter all of the values except FV. Move the cursor to FV and then press  $\alpha$  [solve] to get \$12,908.02.

```
NORMAL FIX2 AUTO REAL RDIAN MP
N=6.00
I%=8.00
PV=-8000.00
PMT=0.00
FV=12908.02
P/Y=1.00
C/Y=12.00
PMT:END BEGIN
```

**Example 4:**

How much money should you deposit in a savings and loan association paying 6% compounded quarterly in order to have \$3,000 in 5 years?

Use the **TVM Solver** and enter all of the values except PV. Move the cursor to PV and then press  $\alpha$  [solve] to get -\$2,227.41.

Notice PV is negative because it is cash paid out by the investor.

```
NORMAL FIX2 AUTO REAL RDIAN MP
N=5.00
I%=6.00
PV=-2227.41
PMT=0.00
FV=3000.00
P/Y=1.00
C/Y=4.00
PMT:END BEGIN
```

If N is set to 20, then change P/Y to 4 to get the same result.

```
NORMAL FIX2 AUTO REAL RDIAN MP
N=20.00
I%=6.00
PV=-2227.41
PMT=0.00
FV=3000.00
P/Y=4.00
C/Y=4.00
PMT:END BEGIN
```