CHAPTER 6

When using the TI-83 Plus or TI-84 Plus calculators you access *Finance* by pressing the APPS key.
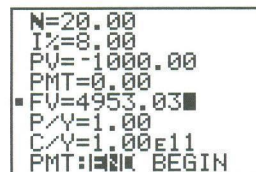
Continuous Compounding

Compounding periods can be yearly, monthly, daily, or hourly. What if compounding occurs every minute, or every second? The number of compounding periods per year is determined by the length of each compounding period.

Example 1:
If $1,000 is invested for 20 years at 8% compounded continuously, what is its future value?

1. Press [2nd] [FINANCE] *(5A)*† and choose **1:TVM Solver** from the CALC menu.

2. Input the values as shown, except FV. Then move the cursor to FV and press [ALPHA] [SOLVE] *(10E)*. (Figure 1)

Note: for continuous compounding, the number of compounding periods, C/Y, must be entered as a very large number, 1×10^{11}. On the calculator, enter 1 [2nd] [EE] *(6B)* 11 for C/Y.

(Figure 1)
```
N=20.00
I%=8.00
PV=-1000.00
PMT=0.00
▪FV=4953.03▮
P/Y=1.00
C/Y=1.00E11
PMT:END BEGIN
```

Example 2:
What is the effective annual rate for 8% compounded continuously? Compare this with the effective annual rate of 8% compounded quarterly.
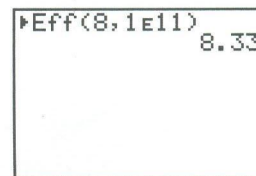
1. Press [2nd] [FINANCE] *(5A)*.

(Figure 2)
```
CALC VARS
8↑irr(
9:bal(
0:ΣPrn(
A:ΣInt(
B:►Nom(
C:►Eff(
D↓dbd(
```

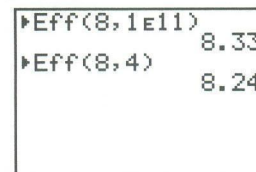2. From the CALC menu choose **C:Eff(**. (Figure 2)

   The syntax for the **Eff(** command is **Eff(**nominal rate,compounding periods). Enter 1×10^{11} for compounding periods. (Figure 3)

(Figure 3)
```
►Eff(8,1E11)
          8.33
```

Notice the difference in the effective rates for continuous compounding and quarterly compounding. (Figure 4)

(Figure 4)
```
►Eff(8,1E11)
          8.33
►Eff(8,4)
          8.24
```

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† **Refer to the section on Key Arrangement in Chapter 1 for an explanation of the key locator codes used in this manual.**

Example 3:
Given an effective annual rate of 6.18% compounded continuously, what is the nominal annual rate?

1. Press [2nd] [FINANCE] *(5A)*. From the CALC menu, choose **B:Nom(**. (Figure 5)

   The syntax for the **Nom(** command is **Nom(**effective rate,compounding periods). The compounding periods for continuous compounding should be entered as a very large number, 1×10^{11}.
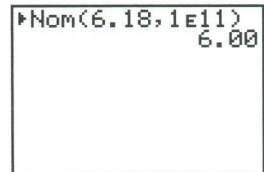
(Figure 5)
```
CALC VARS
8↑irr(
9:bal(
0:ΣPrn(
A:ΣInt(
B▶Nom(
C:▶Eff(
D↓dbd(
```

2. Type in 1 [2nd] [EE] *(6B)* 11 [ )] [ENTER].

The nominal rate is 6%. (Figure 6)

(Figure 6)
```
▶Nom(6.18,1E11)
            6.00
```

Example 4:
Rachael deposits $100 a month for 5 years in an account that is compounded daily at 8%. How much money will be in her account at the end of 5 years?

Use the **TVM Solver** and follow steps 1-2 from *Example 1,* entering the values as shown.

Rachael will have $7,352.64. (Figure 7)

(Figure 7)
```
N=60.00
I%=8.00
PV=0.00
PMT=-100.00
■FV=7352.64
P/Y=12.00
C/Y=365.00
PMT:END BEGIN
```