Section 4: Using a Financial Calculator
Tab 1: Introduction and Objectives

Introduction

In this section, the functions of a financial calculator will be reviewed and some sample problems will be demonstrated.

Objectives

Upon completing this section of the TVOM Tutorial, you will be able to:

- Identify important keys on the financial calculator.
- Demonstrate basic and advanced operations on a financial calculator.
- Solve finance problems using the financial calculator.
- List common mistakes made by students when using a financial calculator.
Important Functions

We will begin this section by reviewing some of the primary and secondary functions of a financial calculator.
Section 4: Using a Financial Calculator
Tab 2: Basic Operation of Your Calculator

1. Secondary function keys

The secondary functions are those printed above the primary function keys.

To use a secondary function, follow this sequence:
1. \(2^{nd}\)
2. Desired secondary function.

For example, to clear the TVOM Worksheet, you would follow this sequence:
1. \(2^{nd}\)
2. CLR TVM

**DEMO:**
*To clear the TVOM worksheet, press the SECOND key and then press the FUTURE VALUE key to access its secondary function, Clear TVOM Worksheet.*

2. Setting P/Y and C/Y

P/Y stands for payments per year, and C/Y for compounding periods per year.

For BA II Plus, the defaults for P/Y and C/Y are 12. That is, 12 payments per year and 12 compounding periods per year.

To set both P/Y and C/Y to be the SAME number such as 1 (one payment per year and annual compounding) follow this sequence:

1. \(2^{nd}\)
2. P/Y
3. “1”
4. ENTER
5. \(2^{nd}\)
6. Quit

Note that if both P/Y and C/Y equal the same number, you only need to enter a value for P/Y.

**DEMO:**
*To set payments per year to one payment per year, and compounding periods per year to annual compounding, press the SECOND key and then press the INTEREST PER YEAR key to access its secondary function, PAYMENTS PER YEAR. Next indicate the number of payments per year, which is 1, and then press the ENTER key. Finally, press the SECOND key and then the COMPUTE key to access its secondary function, QUIT.*
Note: To avoid setting P/Y and C/Y for every problem, you can keep the setting of P/Y and C/Y to be 1 and convert all variables according to “P/Y=1” and “C/Y=1”. In this case, Y stands for period, “P/Y=1” is one payment per period, and “C/Y=1” is one compounding per period. The period can be any time interval such as month, quarter and semiannual.

For example, over the past two years, you saved $200 per month in a saving account that earns 6% monthly compounding. If you set “P/Y=1” and “C/Y=1”, you can think of Y as month. Therefore, “P/Y=1” implies one payment (your deposit) per month, and “C/Y=1” is one compounding per month. The interest rate must be the rate per month or 6/12 or 0.5.

2. Setting P/Y and C/Y

To set P/Y and C/Y for DIFFERENT numbers such as 4 P/Y and 12 C/Y (four payments per year and monthly compounding). Follow this sequence:

1. 2nd
2. P/Y
3. “4”
4. ENTER
5. Downward arrow
6. “12”
7. ENTER
8. 2nd
9. QUIT

DEMO:

To set the number of payments per year to 4, first press the SECOND key, and then the INTEREST PER YEAR key to access its secondary function, PAYMENTS PER YEAR. Next, indicate the number of payments, which is 4, and then press the ENTER key. Look at the screen – it will display P/Y=4.

Now to specify the compounding period as monthly compounding, press the DOWNWARD ARROW key to move from payments per year to compounding per year. Indicate the number of compounding periods, which is 12, and then press the ENTER key. Look at the screen – it will display C/Y=4.

To end this mode, press the SECOND key and then press the COMPUTE key to access its secondary function, QUIT.
3. Using the BGN and END function

BGN and END indicate timing of cash flows.
- BGN is for cash flow at beginning of time period.
- END is for cash flow at end of time period.
- The default of the calculator is END.

To switch from the default of END to BGN, follow the steps below:
1. 2nd
2. BGN
3. 2nd
4. SET
5. CE/C
6. Look at screen to confirm “BGN” has appeared in the upper left corner.

To switch back (i.e., from BGN to END), repeat the steps above. If you do it successfully, BGN should disappear on the screen.

**DEMO:** The calculator’s default is for cash flows that occur at the end of the time period. To set it for cash flows that occur at the beginning of the time period, press the SECOND key and then press the PAYMENT key to access its secondary function, BEGIN. Next press the SECOND key and then press the ENTER key, to access its secondary function, SET. Finally press the CLEAR ENTRY button. Look at the display - you will see Begin in the upper left corner of the screen.

4. How to input variables and get solution

There are five calculator functions for TVOM:
- N
- I/Y
- PV
- PMT
- FV

Recall that these functions are equivalent to the following values in the TVOM equation (shown in the table below). You need to input any four variables in order to calculate the fifth one.

<table>
<thead>
<tr>
<th>Functions on Calculator</th>
<th>Meaning</th>
<th>Variables on Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Number of payments</td>
<td>T</td>
</tr>
<tr>
<td>I/Y</td>
<td>Interest per year or interest per period in case P/Y and C/Y = 1</td>
<td>r</td>
</tr>
<tr>
<td>PV</td>
<td>Present value</td>
<td>PV</td>
</tr>
<tr>
<td>PMT</td>
<td>Payment (amount) per period</td>
<td>C</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------</td>
<td>------</td>
</tr>
<tr>
<td>FV</td>
<td>Future value</td>
<td>FV</td>
</tr>
</tbody>
</table>

To input a variable, start with a number and then press the variable function.

For example, to input five payments follow these steps:
1. 5
2. N
3. Look for N=5 on the display screen.

**DEMO:** To input the 5 as the variable for number of payments, enter the number 5, press the NUMBER OF PAYMENTS key, and then look for N=5 to display on the screen.

To calculate for an unknown variable, such as FV, when N = 24, I/Y=6/12, PV=100 and PMT=0:

1. First enter all the known variables, pressing the function followed by the number:
   - N; 24
   - I/Y; 6 divided by 12
   - PV; 100
   - PMT; 0

2. Next, determine the unknown value:
   - CPT
   - FV

Note: Although sequence of inputs is not required, input from one side will reduce mistakes from omitting some variables.

**DEMO:** When working with equations, it is best to enter the variables from left to right on keys of the calculator, to lessen the chance of omitting a variable. Using the information from the example on this screen,

- Enter the “Number of payments equals 2” by pressing the NUMBER OF PAYMENTS key followed by 24;
- Enter “Interest per year equals 6 divided by 12,” by pressing the INTEREST PER YEAR key then 6, the divided by sign, and then 12, with the resulting answer of .5 displayed on the screen;
- Enter “Present Value equals 100” by pressing the PRESENT VALUE key, and then 100
- Finally enter “Payment amount equals 0,” by pressing the PAYMENT key followed by 0.
- Next, to find the unknown Future Value, press the COMPUTE key and then the FUTURE VALUE key.
5. How to clear TVOM worksheet

To set your variables N, I/Y, PV, PMT and FV to zero, or in other words, to clear the TVOM worksheet:

1. CE/C
2. 2nd
3. CLR TVM

Note that following the sequence above does not clear the setting of the C/Y and the P/Y or BEG/ENG.

**DEMO:** To clear the TVOM worksheet, press the CLEAR ENTRY key. Next press the SECOND key and then press the FUTURE VALUE key to access its secondary function, CLEAR TVOM WORKSHEET.

6. Setting negative and positive cash flows

A positive cash flow indicates inflow, and a negative cash flow indicates outflow.

To specify an outflow for a variable:
- Variable (number).
- +/-

For example, for the outflow future value of $500:

1. 500.
2. +/-
3. FV

Note that the “+/-” key is not the same function as the “-“ key

**DEMO:** To enter the Future value as -500, enter 500, and then press the POSITIVE or NEGATIVE key and finally, the FUTURE VALUE key. You should see FV=-500 on the screen.
Section 4: Using a Financial Calculator
Tab 3: Examples

Example 1

What is the future value of $500 deposited three years ago? The interest rate is 6% monthly compounding.

There are two methods to solve this problem.
- Method 1: Set P/Y and C/Y = 1, to indicate one compounding period per month.
- Method 2: Set P/Y and C/Y = 12, to indicate twelve compounding periods per month.

Example 1, Method 1: P/Y and C/Y = 1

Setting P/Y and C/Y = 1, indicates one compounding period per month. (Note: the frequency of payments is irrelevant in this case.)

The variables are as follows:
- N = 36 (months)
- I/Y = 6/12 (per month)
- PV = -500
- PMT = 0
- FV = ?

To solve, do the following:

1. Set P/Y and C/Y = 1
   - 2nd [P/Y]
   - 1 ENTER
   - 2nd [Quit]
2. Enter the Variables with known values, working across, left to right:

- 36; N
- 6; divided by; 12; =; I/Y
- 500; +/-; PV
- 0; PMT
- CPT; FV

3. Your answer will be FV = 598.34

Note that the negative of 500 indicates present value of the outflow, and the positive of your answer, 598.34, indicates future value of the inflow (i.e., your money to spend).

**Example 1, Method 2: P/Y and C/Y = 12**

Setting P/Y and C/Y = 12, indicates twelve compounding periods per month. Y is a year in this case. (Note: frequency of payments is irrelevant in this case.)

The variables are as follows:
- N = 36 (months or 3 years)
- I/Y = 6 (per year)
- PV = -500
- PMT = 0
- FV = ?

To solve, do the following:

1. Set P/Y and C/Y = 12
   - 2nd [P/Y]
   - 12 ENTER
   - 2nd [Quit]

2. Enter the Variables with known values, working across, left to right:

- 36; N
- 6; I/Y
- 500; +/-; PV
- 0; PMT
- CPT; FV

3. Your answer, like in Method 1, will be FV = 598.34
Example 2

If you borrow $2,000 from your uncle to pay for a credit card, how much do you have to pay back every three months in the next two years? You want to give your uncle 4% return compounded quarterly.

\[
\begin{array}{cccc}
0 & 1 & 2 & 8 \\
\mid r = 4\% / 4 \mid & \mid \text{---} \mid & \mid \text{---} \mid & \mid \text{C} \mid \\
2,000 & \text{C} & \text{C} & \text{\---} & \text{C} \\
\end{array}
\]

There are two methods to solve this problem.
- Method 1: Set P/Y and C/Y = 1, to indicate one compounding period per month.
- Method 2: Set P/Y and C/Y = 4, to indicate four payments per year and four compounding periods per month.

**Example 2, Method 1: P/Y and C/Y = 1**

Setting P/Y and C/Y = 1, indicates one payment per quarter, and one compounding period per quarter. As such, Y indicates a quarter in this case.

The variables are as follows:
- \( N = 8 \) (payments);
- \( I/Y = 4\% / 4 \) (per quarter);
- \( PV = 2,000 \);
- \( PMT = ? \);
- \( FV = 0 \)

To solve, do the following:

1. Set P/Y and C/Y = 1
   - \( \text{2}\text{nd} \ [P/Y] \)
   - \( 1 \ \text{ENTER} \)
   - \( \text{2}\text{nd} \ [\text{Quit}] \)

2. Enter the Variables with known values, working across, left to right:
   - \( 8; \ N \)
   - \( 4; \text{divided by sign;} \ 4; =; \ I/Y \)
   - \( 2000; \ PV \)
   - \( 0; \ FV \)
   - \( \text{CPT}; \ PMT \)
Your answer should be -261.38. Note that the negative number in your answer indicates outflow or payment that you have to make.

**Example 2, Method 2: P/Y and C/Y = 4**

Setting P/Y and C/Y = 4 indicates four payments per year and four compounding periods per month.

The variables are as follows:
- N = 8 (payments)
- I/Y = 4% (per year)
- PV = 2,000
- PMT = ?
- FV = 0

To solve, do the following:

1. Set P/Y and C/Y = 1
   - 2nd [P/Y]
   - 1 ENTER
   - 2nd [Quit]

2. Enter the Variables with known values, working across, left to right:
   - 8; N
   - 4; divided by sign; 4; =; I/Y
   - 2000; PV
   - 0; FV
   - CPT; PMT

Your answers should be -261.38. Note that the negative number in your answer indicates outflow or payment that you have to make.

**Example 3**

Judy plans to buy a new laptop which costs $2,500. The store has a financing option - 3%APR, 12 payments with the first payment due on the purchase date. What is the required monthly payment?
There are two methods to solve this problem.

- Method 1: Set P/Y and C/Y = 1 and BGN.
- Method 2: Set P/Y and C/Y = 12 and BGN.

**Example 3, Method 1: P/Y and C/Y = 1 and BGN**

Setting “P/Y and C/Y = 1” indicates one payment per month, and one compounding period per month. Y is a month in this case.

The variables are as follows:
- N = 12 (payments)
- I/Y = 3%/12 (per month)
- PV = 2,500
- PMT = ?
- FV = 0

To solve, do the following:

1. Make sure BGN appears on screen; if not, do the following:
   - 2nd; [BGN]; 2nd; [SET]
   - CE/C

2. Set P/Y and C/Y = 1
   - 2nd [P/Y]
   - ENTER
   - 2nd [Quit]

3. Enter the Variables with known values, working across, left to right:
   - 12; N
   - 3; divided by sign; 12; =; I/Y
   - 2500; PV
   - 0; FV
   - CPT; PMT

Your answer should be PMT = -211.21
Note that the negative number indicates outflow or payment that you have to make.

**Example 3, Method 2: P/Y and C/Y = 12 and BGN**

Setting “P/Y and C/Y = 12” indicates twelve payments per year, and twelve compounding periods per year. Y is year in this case.

The variables are as follow:
- **N = 12** (payments)
- **I/Y = 3%** (per year)
- **PV = 2,500**
- **PMT = ?**
- **FV = 0**

To solve, do the following:

1. Make sure BGN appears on screen; if not, do the following:
   - **2nd; [BGN]; 2nd; [SET]**
   - **CE/C**

2. Set P/Y and C/Y = 1
   - **2nd [P/Y]**
   - **ENTER**
   - **2nd [ Quit]**

3. Enter the Variables with known values, working across, left to right:
   - **12; N**
   - **3; I/Y**
   - **2,500; PV**
   - **0; FV**
   - **CPT; PMT**

Your answer should be **PMT = -211.21**

Note that the negative number indicates outflow or payment that you have to make.
Section 4: Using a Financial Calculator
Tab 4: Advanced Operations

1. Locating the PV of Uneven Cash Flows

To calculate present value of uneven cash flows, use the following calculator functions:

- **CF**
- **NPV**

Use the input values of cash flows (CF) and interest rate (I), and follow three steps including:
   2. Input cash flow (CF or C) and its frequency (F).
   3. Compute present value of uneven cash flows.

These steps will be discussed in detail below.

**Step 1: Clear Cash Flow Worksheet.**

To clear the Cash Flow Worksheet:
- CF
- 2nd
- CLR WORK

The calculator will display
CFo = 0.00

**DEMO:** To clear the Cash Flow worksheet, press Cash Flow, then the "2nd" key to access it’s secondary function, and finally Clear Worksheet.

Note: This step is very important because some cash flows might be unintentionally added to a problem. For example, let assume that the calculator was previously used to calculate present value of 10 different cash flows from Year 1-10 using Cash Flow worksheet. Now the same calculator is used to calculate present value of only 5 cash flows from Year 1-5. If the worksheet is not clear prior to the calculation of the current problem, cash flows of Year 6-10 from the previous problem will be added to the current problem and create wrong answer.

**Step 2: Input cash flow (CF or C) and its frequency (F)**
With regard to notation, the number following the CF, C and F indicates timing of cash flow.
- **CF0** is the cash flow at time period 0 or initial cash flow.
- **C01** is cash flow at time period 1.
- **F01** = frequency of C01, and so on.

To input CF and F you will use these keys:

- **ENTER**
- **↓**

For example, the initial cash flow is 0, cash flow at Year 1 is 3,000, and cash flows at Year 2-4 are 1,000.

```
<table>
<thead>
<tr>
<th>Time</th>
<th>CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>3,000</td>
</tr>
<tr>
<td>2</td>
<td>1,000</td>
</tr>
<tr>
<td>3</td>
<td>1,000</td>
</tr>
<tr>
<td>4</td>
<td>1,000</td>
</tr>
</tbody>
</table>
```

To input these cash flows, follow the steps below. (Note: The default for CF0 is 0, and the default for all F’s is 1, so these steps may be skipped, if preferred)

- **0 ENTER**
- **↓**
- **3,000 ENTER**
- **↓**
- **1 ENTER**
- **↓**
- **1,000 ENTER**
- **↓**
- **3 ENTER**

```
r=10%
PV = ?
```
**DEMO:** To input cash flow and its frequency, press ZERO and then the ENTER key. Note that if your calculator has a default of “Cash flow at Time Period Zero equal to Zero” then you may skip this step.

Next, press the DOWNWARD ARROW key. Input the Cash Flow at Time Period One, which is 3,000, by entering the number 3,000 and then pressing the ENTER key.

Press the DOWNWARD ARROW key again, and input the Frequency of the Cash Flow at Time Period One, which is 1, by entering the number 1 and then pressing the ENTER key. Note again that if your calculator has a default of Frequency of the Cash Flow at Time Period One that is equal to 1, you may skip this step.

Press the DOWNWARD ARROW key again, and input the Cash Flow at Time Period Two, which is 1,000, by entering then number 1,000 and the pressing the ENTER key.

Press the DOWNWARD ARROW key again, and input the Frequency of the Cash Flow at Time Period Two, which is 3, by entering the number 3 and then pressing the ENTER key.

**Step 3: Compute present value of uneven cash flows**

Using this example:

```
0  1   2   3   4  
0  3,000 1,000 1,000 1,000
```

Follow this sequence:

1. NPV
2. 10 ENTER
3. or down to go back to NPV screen.
4. CPT

Your answer will be: 4,988.05.
DEMO - To compute present value of uneven cash flows, first, press the NET PRESENT VALUE key. Next, indicate the Interest Rate by entering the number 10 and then pressing the ENTER key.

Now, use either the UPWARD ARROW key or the DOWNWARD ARROW key to return to the NET PRESENT VALUE Screen.

Finally, press the COMPUTE key to find the present value of the uneven cash flows, which is 4,988.05

**Example 1:** Calculate present value of the following cash flows.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1,000</td>
<td>0</td>
<td>1,000</td>
<td>0</td>
<td>1,000</td>
</tr>
</tbody>
</table>

\[ r = 10\% \]

\[ PV = ? \]

Note that in order for any \( F \) to be greater than 1, cash flows must be equal and consecutive. For example, \( F_{01} \) of the above example cash flows is NOT equal to 3, but 1.

In this case, \( C_0 = 1,000; F_{01} = 1; C_2 = 0; F_{02} = 1; C_3 = 1,000; F_{03} = 2. \)

\( C_0 = 1,000; F_{01} = 1; C_2 = 0; F_{02} = 1; C_3 = 1,000; F_{03} = 2. \)
Your answer will be 2343.42

**DEMO** – To calculate the present value of the cash flows in this example, first clear the cash flow worksheet by doing the following: Press the CASH FLOW key, then press the 2nd key and finally the press the CLEAR ENTRY Key to access its secondary function, CLEAR WORKSHEET.

You can skip the step of inputting a value for Initial Cash Flow, also known as the Cash Flow at Time Period Zero, because the default for the Initial Cash Flow is equal to zero.

Next input the Cash Flow at Time Period One, which is 1,000, by pressing the DOWNWARD ARROW key, then entering the number 1,000 and then pressing the ENTER key.

Next go the Frequency of the Cash Flow at Time Period One by pressing the DOWNWARD ARROW key. Since the default setting equals one as in the example, there is no need to input a value.

Next, input the value for the Cash Flow at Time Period Two, which is 0, by pressing the DOWNWARD ARROW key, entering the number 0 and then pressing the ENTER key.

Next, go to the Frequency of the Cash Flow at Time Period 2 by pressing the DOWNWARD ARROW key. Since the default setting equals one as in the example, there is no need to input a value.

Next, input the Cash Flow at Time Period Three, which is equal to 1,000, by pressing the DOWNWARD ARROW key, entering the number 1,000 and then pressing the ENTER key.

Next input the Frequency of the Cash Flow at Time Period Three, which is 2, by pressing the DOWNWARD ARROW key, entering the number 2, and then pressing the ENTER key.
Now, compute the present value by pressing the **NET PRESENT VALUE** key, and then indicate the 10% interest rate by entering the number **10** and pressing the **ENTER** key.

Finally press the **DOWNWARD ARROW** key to return to the **Net Present Value** screen, and press the **COMPUTE** key to find the present value, which is **2,343.42**.

**Example 2: Calculate present value of the following cash flows.**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
<td>50</td>
<td>100</td>
<td>-100</td>
</tr>
<tr>
<td>r=12%</td>
<td>200</td>
<td>-100</td>
<td>200</td>
<td></td>
</tr>
</tbody>
</table>

PV = ?

In this case, CF0 = -100; C01 = 50; F01=1, C02 = 100; F02=1; C03=-100; F03=1; C04=200; F04=1.

CF0 = -100; C01 = 50; F01=1, C02 = 100; F02=1; C03=-100; F03=1; C04=200; F04=1.

- **CF**
- **2nd**
- **CLR WORK**
- **100 +/- ENTER**
- **50 ENTER**
- **100 ENTER**
- **100 +/- ENTER**
- **100 ENTER**
- **200 ENTER**
- **NPV**
Your answer will be: 80.29

**DEMO** – To calculate present value of the cash flows in the example, first clear the Cash Flow Worksheet by pressing the CASH FLOW key, the 2\textsuperscript{nd} Key and then the CLEAR ENTRY key, to access its secondary function, CLEAR WORKSHEET.

Input the Initial Cash Flow, also known as the Cash Flow at Time Period Zero, which is -100, by entering the number 100, pressing the +/- key and then pressing the ENTER key.

Next input the Cash Flow at Time Period One, which is 50, by pressing the DOWNWARD ARROW key, then entering the number 50 and then pressing the ENTER key.

Next go to the Frequency of the Cash Flow at Time Period One by pressing the DOWNWARD ARROW key. Since the default setting equals one as in the example, there is no need to input a value.

Next, input the value for the Cash Flow at Time Period Two, which is 100, by pressing the DOWNWARD ARROW key, entering the number 100 and then pressing the ENTER key.

Next go to the Frequency of the Cash Flow at Time Period Two by pressing the DOWNWARD ARROW key. Since the default setting equals one as in the example, there is no need to input a value.

Next input the Cash Flow at Time Period Three, which is equal to -100, by pressing the DOWNWARD ARROW key, entering the number 100, pressing the +/- key and then pressing the ENTER key.

Next go to the Frequency of the Cash Flow at Time Period Three by pressing the DOWNWARD ARROW key. Since the default setting equals one as in the example, there is no need to input a value.

Next input the Cash Flow at Time Period Four, which is 200, by pressing the DOWNWARD ARROW key, entering the number 200, and then pressing the ENTER key.
Next, go to the **Frequency of the Cash Flow at Time Period Four** by pressing the **DOWNWARD ARROW** key. Since the default setting equals one as in the example, there is no need to input a value.

Now, compute the present value by pressing the **NET PRESENT VALUE** key, and then indicate the 12% interest rate by entering the number **12** and pressing the **ENTER** key.

Finally press the **UPWARD ARROW** key to return to the **Net Present Value** screen, and press the **COMPUTE** key to find the present value, which is **80.29**.

### 2. Convert between Quoted Rate and Effective Annual Rate

To convert between quoted rate and effective annual rate, use this secondary function: **ICONV**.

The required inputs are

1. Compounding period per year (C/Y).
2. Either quoted rate (also called nominal rate, NOM) or effective annual rate (EFF).

**Example 1:** Compute the effective annual rate of 10% monthly compounding.

1. 2nd **ICONV**
2. 10 **ENTER**
3. **↓** **↓**
4. **ENTER**
5. 12 **ENTER**
6. **↑**
7. **CPT**

Effective rate equals **10.47%**.

Press the **UPWARD ARROW** key to move to the **Effective Annual Rate** screen.

Finally press the **COMPUTE** key to compute the **Effective Annual Rate** which equals **10.47%**.
**DEMO:** To compute the effective annual rate of 10% monthly compounding, first access the *Interest Conversion Worksheet* by pressing the 2\textsuperscript{nd} key and then the number “2” to access its secondary function, INTEREST CONVERSION.

Next, input the 10% nominal rate by entering the number 10 and then pressing ENTER.

Press the DOWNWARD ARROW key twice to move to the *Compounding Periods Per Year* screen.

Input the 12 compounding periods per year, or in other words, monthly compounding, by entering the number 12 and then pressing the ENTER key.

**Example 2:** Compute nominal rate quarterly compounding of 12% effective annual rate.

\[
\begin{align*}
\text{2nd} & \quad \text{ICONV} \\
\downarrow & \\
\text{ENTER} & \\
12 & \downarrow \\
\text{ENTER} & \\
4 & \downarrow \\
\text{CPT} & \\
\end{align*}
\]

Nominal rate equals to 11.49%

**DEMO:** To compute nominal rate quarterly compounding of 12% effective annual rate, first access the *Interest Conversion Worksheet* by pressing the 2\textsuperscript{nd} key and then the number “2” to access its secondary function, INTEREST CONVERSION.

Next, press the DOWNWARD ARROW to move to the *Effective Annual Rate* screen.

Input the 12% effective rate by entering the number 12 and the pressing the ENTER key.
Press the **DOWNWARD ARROW** key to move to the **Compounding Periods Per Year** screen.

Input the **4 compounding periods per year**, or in other words, quarterly compounding, by entering the number **4** and then pressing the **ENTER** key.

Press the **DOWNWARD ARROW** key to move to the **Nominal or Quoted Rate** screen.

Finally press the **COMPUTE** key to compute the **Nominal or Quoted Rate** which equals **11.49%**.
Section 4: Using a Financial Calculator
Tab 5: Three Common Mistakes

Below are three common mistakes that students make.

1. Forgetting to change C/Y and P/Y values for Frequency of compounding
   - Check to see if the default of your calculator is C/Y and P/Y is 1.
   - If interest rate is not compounded monthly, P/Y and C/Y must be set to a new number, and/or I/Y must be modified.
   - See the “Basic Operations” section to recall how to set P/Y and C/Y.

2. Forgetting to switch from BGN to END or vice versa.
   - Remember that the CE/C and/or the CLR TVM function do NOT turn off the BGN setting.
   - See the “Basic Operations” section to recall how to switch between BGN and END.

3. Rounding the I/Y variable
   - For example, if the interest rate is 1.99% monthly compounding and C/Y and P/Y =1, then I/Y must be interest rate per month or 1.99/12.
   - You should NOT round 1.99/12 equal to 0.17, and key in 0.17 as I/Y.
   - In order to keep all decimal places in calculation, you should key in the following:
     - 1.99
     - divided by sign
     - 12
     - =
     - I/Y
   .