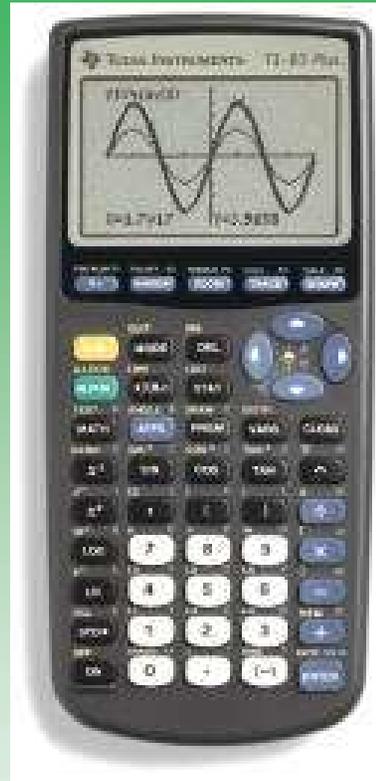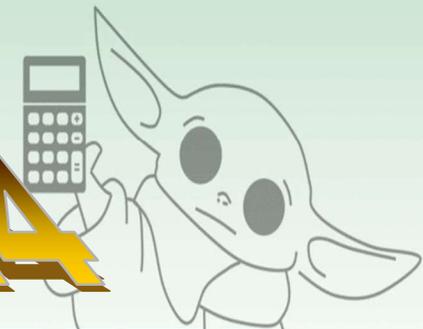# ST. JEAN DE BREBEUF MATHEMATICS

CHAPTER 8.4
THE TVM SOLVER

KEY CONCEPTS

The **TVM Solver** on a graphing calculator is a feature on the *TI-83/84 Plus* and is used for various financial calculations

It can be used to solve problems involving *compound interest*.

Enter the <u>known</u> values, and enter **0** for the <u>unknown</u> value.

With your cursor at the location of the unknown value, press **ALPHA** then **ENTER** on your graphing calculator

The TVM Solver uses the compound interest formula $A = P(1 + i)^n$.

When **PV** or **FV** are displayed as <u>negative</u> numbers, they represent **money you cannot use right now**

When **PMT** is displayed as a <u>negative</u>, it represents **money being paid out**
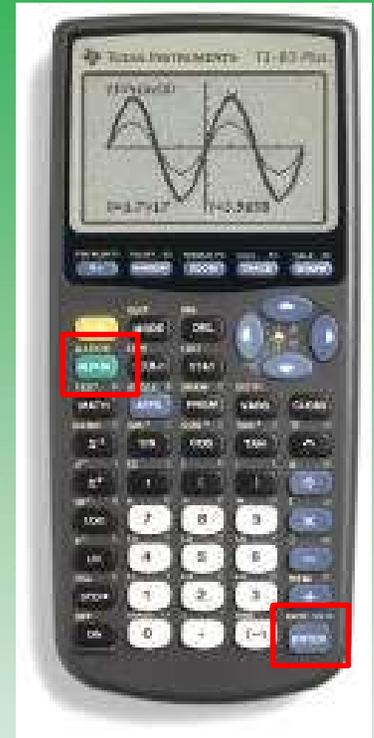
CHAPTER 8.4 THE TVM SOLVER

KEY CONCEPTS

THE TVM SOLVER SCREEN

N = Total # of payments (# of years × # of payments per year)

I% = Interest rate per year

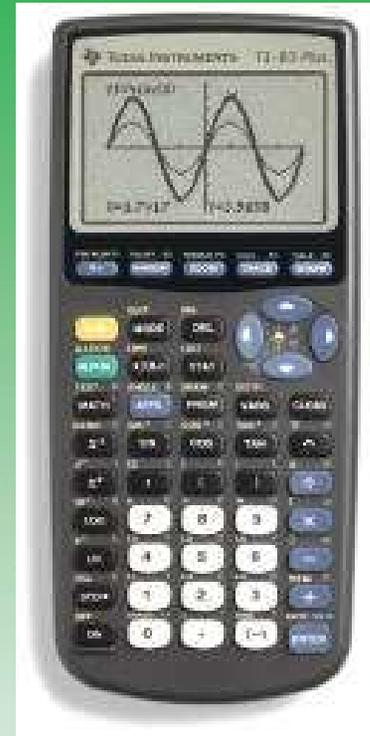**PV** = Present value/principal investment

PMT = Amount of the regular payment (expressed as a <u>negative</u>)

FV = Future value/final amount

P/Y = # of payments per year

C/Y = # of compounding periods per year

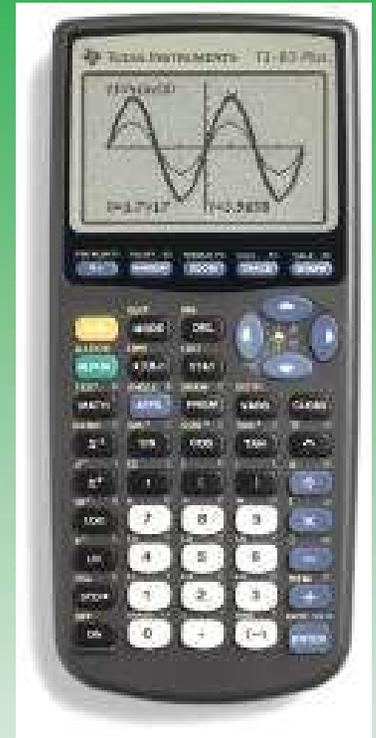**PMT: END BEGIN** Payment made at the end or beginning of a regular interval

CHAPTER 8.4 THE TVM SOLVER

KEY CONCEPTS

To enter the **TVM Solver**

       1. Press **APPS**

       2. Press **1:Finance**

       3. Press **1:TVM Solver**

EXAMPLE 1   *Future Investment*

Samira invested **$1500** into an account with an interest rate of **2% per year**, **compounded quarterly**. What will the investment be worth **after three years**?

N = 3 x 1 **3**   ←   # of years x # of payments
                             → Represents that there is only **one** payment in three years

I% = **2**

PV = **– 1500**   ←   <u>Negative</u> value represents that the money is <u>being paid out</u>

PMT = **0**

FV =   **0**   **1592.52**   ←   Press **ALPHA** then **ENTER**

P/Y =   **1**   ←   Only **one** payment is made

C/Y =   **4**   ←   *Quarterly* compounding
                     → **4x** per year

The investment will be worth **$1592.52** in three years.

EXAMPLE 2   *Discount Investment*

An investment will be worth **$5000** in **four years**. If the interest rate is **6% per year**, **compounded monthly**, what is the **present value** of the investment?

N = 4 x 1 **4**   ← # of years x # of payments
→ Represents that there is only **one** payment in four years

I% = **6**

PV = **0** **– 3935.49**   ← Press **ALPHA** then **ENTER**
→ <u>Negative</u> value represents that the money is <u>being paid out</u>

PMT = **0**

FV = **5000**

P/Y = **1**   ← Only **one** payment is made

C/Y = **12**   ← *Monthly* compounding
→ **12x** per year

The *present value* of the investment will be **$3935.49**

EXAMPLE 3 *Loans*

Giancarlo took out a **$2000** loan from a bank, at an interest rate of **6.4% per year**, **compounded semi-annually**. Giancarlo must repay the loan <u>immediately</u> after **five years**. How much must he repay?

N = 5 x 1 **5** ← # of years x # of payments
→Represents that there is only **one** payment in five years

I% = **6.4**

PV = **2000** ← *** <u>All</u> loans are entered as *Present Value* since they need to be paid off <u>immediately</u>.

PMT = **0**

FV = **0** **– 2740.48** ←Press **ALPHA** then **ENTER** → <u>Negative</u> value represents that the money is <u>being paid out</u>

P/Y = **1** ← Only **one** payment is made

C/Y = **2** ← *Semi-annual* compounding → **2x** per year

He will need to repay
$2740.48

EXAMPLE 4 *Determining Length of Time*

Mario deposited **$500** into an account paying interest at **2.4% per year**, **compounded monthly**. How long will it take for the money to grow to **$750**?

N = 0 **16.9**

I% = **2.4**

PV = **– 500**

PMT = **0**

FV = **750**

P/Y = **1**

C/Y = **12**

Press **ALPHA** then **ENTER**
→ It will take approximate **17 months** for the money to grow to $750

Negative value represents that the money is being paid out

Only **one** payment is made

Monthly compounding
→ 12**x** per year

CABILAN MATH ONLINE.COM

CHAPTER 8.4 THE TVM SOLVER

Homework:

Page 444 – 445 #1 – 14 (using TVM Solver)

CABILAN MATH ONLINE.COM