

Notes - TVM Solver.pdf

# INSTRUCTIONS on using the TVM-Solver...

1.) On the TI-83, press 2<sup>nd</sup>, then FINANCE, then select 1:TVM Solver. On the TI-83 plus and TI-84, press APPS, then 1:FINANCE, then 1:TVM Solver. You should see the screen below:

```
N=
I% = 0
PV = 0
PMT = 0
FV = 0
P/Y = 1
C/Y = 1
PMT: [2ND] [ENTER] BEGIN
```

2.) Now, suppose you are taking out a 5-year loan on \$25000 at 6% annual interest compounded monthly and you want to know the monthly payment. Fill in the values on the TVM Solver screen as shown:

```
N = 60
I% = 6
PV = 25000
PMT =
FV = 0
P/Y = 12
C/Y = 12
PMT: [2ND] [ENTER] BEGIN
```

3.) Now, move the cursor to PMT, press the green ALPHA key, then ENTER. Your payment will show up as a negative number:

```
N = 60
I% = 6
PV = 25000
PMT = -483.32003...
FV = 0
P/Y = 12
C/Y = 12
PMT: [2ND] [ENTER] BEGIN
```

**NOTE:** a **negative** number means that the money is coming 'out of your pocket'

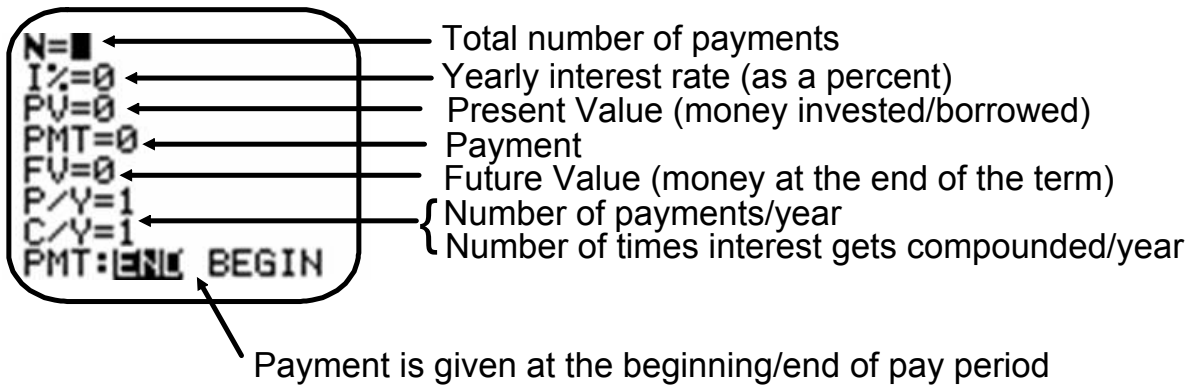
4.) Suppose you know you can afford a \$250 per month payment on a 60 month loan at 6% annual interest compounded monthly. Fill out the TVM Solver screen as shown:

```
N = 60
I% = 6
PV =
PMT = -250
FV = 0
P/Y = 12
C/Y = 12
PMT: [2ND] [ENTER] BEGIN
```

5.) To find how much you can afford to borrow, move the cursor to PV, press the green ALPHA key, then ENTER. The amount you can afford to borrow is shown:

```
N = 60
I% = 6
PV = 12931.39019
PMT = -250
FV = 0
P/Y = 12
C/Y = 12
PMT: [2ND] [ENTER] BEGIN
```

## SOLUTION WITH TI-84 (Finance APP)...



**EXAMPLE 1**  
p. 485

**Determining the future value of an investment involving regular deposits**

Darva is saving for a trip to Australia in 5 years. She plans to work on a student visa while she is there, so she needs only enough money for a return flight and her expenses until she finds a job. She deposits \$500 into her savings account at the end of each 6-month period from what she earns as a server. The account earns 3.8%, compounded semi-annually. How much money will be in the account at the end of 5 years? How much of this money will be earned interest?



SOLUTION WITH TVM-Solver...

```

N=10
I%=3.8
PV=0
PMT=-500
FV=5449.896878
P/Y=2
C/Y=2
PMT: [ ] BEGIN
    
```

*find*

*A*  
↓  
*\$5449.90*

SOLUTION by hand...

$$P = N \times PMT$$

$$P = 10 \times 500$$

$$P = 5000$$

$$b) I = A - P$$

$$= 5449.90 - 5000$$

$$= 449.90$$

EXAMPLE 2  
p. 487

Comparing a regular payment investment with a single payment investment

Adam made a \$200 payment at the end of each year into an investment that earned 5%, compounded annually. Blake made a single investment at 5%, compounded annually. At the end of 5 years, their future values were equal.

- a) What was their future value?
- b) What principal amount did Blake invest 5 years ago?
- c) Who earned more interest? Why?

Adam (APP)

a)

```
N=5
I%=5
PV=0
PMT=-200
FV=1105.12625
P/Y=1
C/Y=1
PMT: [ ] BEGIN
```

\$1105.13

c) Adam...

$$F = 5 \times 200$$

$$P = 1000$$

$$I = 1105.13 - 1000$$

$$I = 105.13$$

Blake  $A = P(1 + \frac{r}{n})^{nt}$

$$P = \frac{A}{(1 + \frac{r}{n})^{nt}}$$

$$= \frac{1105.13}{(1 + \frac{0.05}{1})^{1 \times 5}}$$

```
1105.13 / (1 + 0.05)
^5
865.8982723
```

\$865.90

$$c) A = 1105.13$$

$$- P = 865.90$$


---


$$I = 239.23$$

**EXAMPLE 3**  
p. 489

Determining the interest rate of a regular payment investment

Jeremiah deposits \$750 into an investment account at the end of every 3 months. Interest is compounded quarterly, the term is 3 years, and the future value is \$10 059.07. What annual rate of interest does Jeremiah's investment earn?

```
N=12
I%=8.000019121
PV=0
PMT=-750
FV=10059.07
P/Y=4
C/Y=4
PMT: [ ] BEGIN
```

*8%*

**EXAMPLE 4**  
p. 490

**Determining the regular payment amount of an investment**

Celia wants to have \$300 000 in 20 years so that she can retire. Celia has found a trust account that earns a fixed rate of 10.8%, compounded annually.

- a) What regular payments must Celia make at the end of each year to meet her goal of \$300 000?
- b) How much interest will she earn over the 20 years?

a)

```
N=20
I%=10.8
PV=0
PMT=-4781.08988
FV=300000
P/Y=1
C/Y=1
PMT:  END  BEGIN
```

Yearly Payment  
\$4781.09

b)

```
4781.09*20          95621.8
300000-95621.80    204378.2
I=
```

EXAMPLE 5  
p. 491

Determining the term of a regular payment investment

On Luis's 20th birthday, he started making regular \$1000 payments into an investment account at the end of every 6 months. He wants to save for a down payment on a home. His investment earns 3.5%, compounded semi-annually. At what age will he have more than \$18 000?

# years = 15.3  
 2 pmts/yr  
 = 7.9 years  
 By 28th B day

\*  $N = 15.3$  payments  
 $I\% = 3.5$   
 $PV = 0$   
 $PMT = -1000$   
 $FV = 18000$   
 $P/Y = 2$   
 $C/Y = 2$   
 $PMT: END$

EXPLS

## HOMEWORK...

p. 493: #3, 5, 6, & 9

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**NOTE:** When using the TI-84...

Each question must have the following completed for homework  
AND beginning of class tomorrow you will be given time to solve.

```
N=  
I%=  
PV=  
PMT=  
FV=  
P/Y=  
C/Y=  
PMT:  END  BEGIN
```



## Attachments

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