

HOMEWORK???

p. 468: **Rule of 72...**

#3 (only estimate the doubling time)

#5a & #8

Compound Interest (Future Value)

#10 & #12

p. 478: **Compound Interest (Present Value)**

#4, #6, #7, & #9

12. Lenny has \$5000 to invest and is looking at different GICs, as shown in the table to the left. These GICs cannot be redeemed until their maturity.

- a) Why do you think the interest rates increase as the term increases?
- b) Lenny cannot decide whether to invest \$5000 for 10 years or to invest \$5000 for 5 years and then reinvest for another 5 years.
 - i) Compare the future values of each option. What assumptions are you making?
 - ii) What are the advantages and disadvantages of each option?

Term (years)	Rate (%)
1	1.35
2	1.65
3	1.90
4	2.15
5	2.65
6	2.70
7	2.85
8	2.90
9	3.00
10	3.25

a) Bank has \$ longer so they can make \$ from their money!

b) ^{10 years}
 $5000(1+0.0325/1)^{10}$
 6884.471519
 Best

* Assumed that rate is compounded annually

- most \$
- locked for 10 years

$5000(1+0.0265/1)^5$
 5698.555375
 Ans $(1+0.0265)^5$
 6494.706673

* assume ...
 - annual interest rate
 - in 5 years → rates same

- rates increase in 5 yrs
 - less \$

8.5

Investments Involving Regular Payments

GOAL

Determine the future value of an investment that earns compound interest involving regular payments.

EXAMPLE 1
p. 485

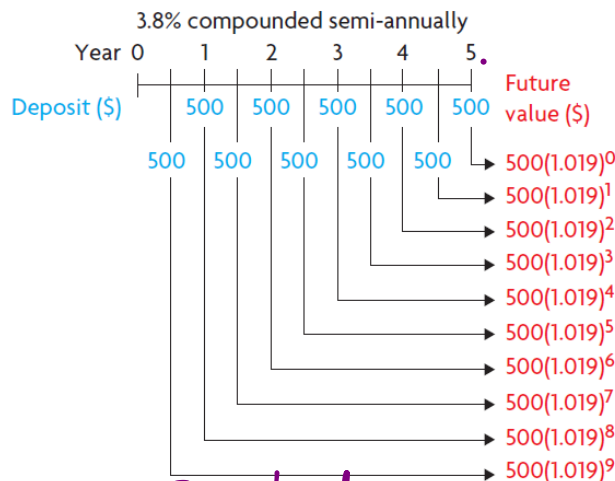
Determining the future value of an investment involving regular deposits

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 BY HAND...

I drew a timeline to show the future value of each of the \$500 deposits that I made at the end of each 6-month period for 5 years.



I could see that I needed to do 10 calculations and then determine the sum.

$$A = 500 \left(1 + \frac{0.038}{2} \right)^{10}$$

By Hand

$$A = P \times \left[\frac{(1 + r)^n - 1}{r} \right]$$

$$500 \times \left[\frac{(1.019)^{10} - 1}{0.019} \right] = 5449.896878$$

$$5449.896878 - 5000 = 449.896878$$

I = 5449.90

APP

```

N=10
I%=3.8
PV=0
PMT=-500
FV=449.896878
P/Y=2
C/Y=2
PMT: [ ] BEGIN
    
```

Notes - TVM Solver.pdf

INSTRUCTIONS on using the TVM-Solver...

1.) On the TI-83, press 2nd, 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'

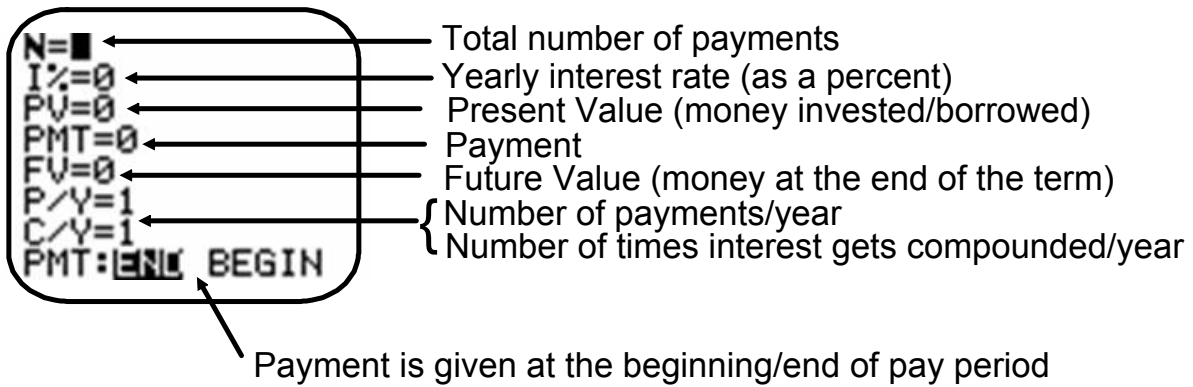
4.) Suppose you know you can afford a \$250 per month payment on a 60 month loan at 6% annual interest compounded monthly. Fill out the TVM Solver screen as shown:

```
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)...



Attachments

Notes - TVM Solver.pdf