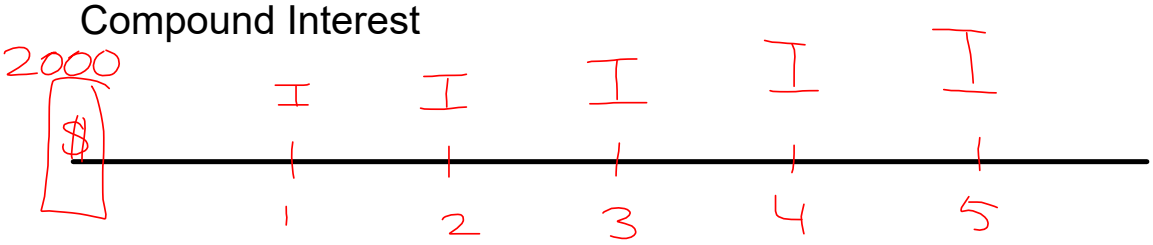
https://www.youtube.com/watch?v=TN7tM7iOx4E Virtual TI for Mac users.

https://www.youtube.com/watch?v=r6Aiyjqhsvs Virtual TI for PC users.

Compound Interest

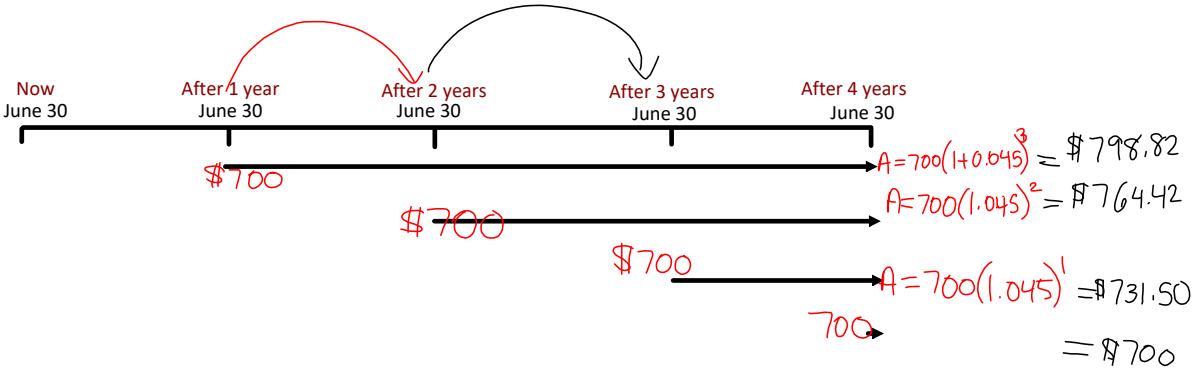


Annuities

7.3 Amount of an Annuity (FV)

Annuity: A series of equal payments made at regular intervals (savings plan, paying off a debt, etc.)

Last June 30, Nigel decided to save for a trip when he graduates. Starting next June 30, and for each of the following 3 years, he plans to deposit $700 into an account that pays 4.5%/a, compounded annually. How much money will Nigel have accumulated when he makes the last deposit into this annuity?



- How much is each deposit worth at the end of the 4 years?
- What type of series is the sum of the deposits?

- What is the formula to find the sum of the terms?

See unit 6.

- Annuity Formulas:

$$A = \frac{R[(1+i)^n - 1]}{i}$$

- Use this to find the amount.

$$R = \frac{Ai}{\left[(1+i)^n - 1\right]}$$

- Use this to find the regular payment.

- *where*
- A = Amount at the time of the last payment
- R = Regular payment
- i = Interest rate per compound pd.
- n = # of compound periods/# of payments

Ex. 1 Mary deposits $250 into an account at the end of each month paying 7.2%/a compounded monthly for 5 years. How much money will she have at the end of 5 years?

By Hand:

$A =$

$R = \$250$

$i = \frac{0.072}{12}$

$n = 5 \times 12 = 60$

$$A = R\left[\frac{(1+i)^n - 1}{i}\right]$$

$$= 250\left[\frac{\left(1 + \frac{0.072}{12}\right)^{60} - 1}{\frac{0.072}{12}}\right]$$

$A = \$17\ 991.18$

Interest

$250 \times 60 = 15000$

Interest $= 17\,991.18 - 15000$

$= \$2991.18$

By TVM:

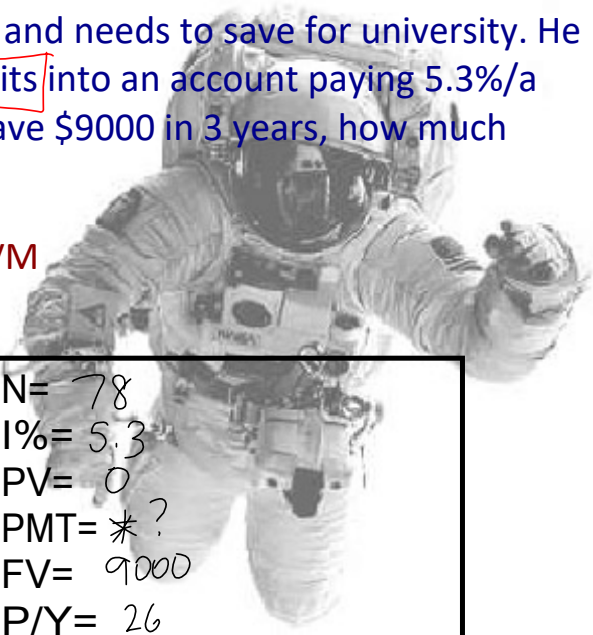
APPS , 1: Finance..., ENTER , 1: TVM Solver... ENTER

N = # of compounding periods
I% = interest rate/a as a percent
PV = present value (P)
PMT = the payment amount (put as "0" if there are no payments)
FV = future value (A)
P/Y = number of payments per year
C/Y = number of compound periods per year
PMT: = choose END

N= 60
I%= 7.2
PV= 0
PMT= −250
FV= ?
P/Y= 12
C/Y= 12
PMT: END BEGIN

FV
$17 991.18

Ex. 2 Cameron wants to be an astronaut and needs to save for university. He plans on making regular bi-weekly deposits into an account paying 5.3%/a compounded bi-weekly. If he wants to have $9000 in 3 years, how much does he need to deposit each time?



By Hand

$A = 9000$

$R = ?$

$i = \frac{0.053}{26}$

$n = 26 \times 3 = 78$

$$R = \frac{Ai}{[(1+i)^n - 1]}$$

$$= \frac{9000\left(\frac{0.053}{26}\right)}{\left[\left(1+\frac{0.053}{26}\right)^{78} - 1\right]}$$

$R = \$106.57$

By TVM

N= 78
I%= 5.3
PV= 0
PMT= *?
FV= 9000
P/Y= 26
C/Y= 26
PMT: END BEGIN

Ex. 3 Who wants to be a Millionaire?

You want to know how much to put away every month, from now until you retire, to become a millionaire. Assume interest at 5% compounded monthly, and that you retire at 65.

16 → 65

N= 49 × 12 = 588
I%= 5
PV= 0
PMT= ?
FV= 1 000 000
P/Y= 12
C/Y= 12
PMT: END BEGIN

Interest
395.71 × 588
= 232 677.48

↓

Interest
767 322.52

PMT : $395.71

65 → 95

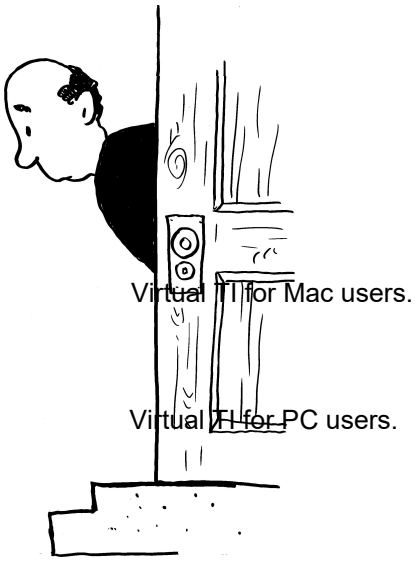
N= 30 × 12 = 360
I%= 5
PV= 1 000 000
PMT=
FV= 0
P/Y= 12
C/Y= 12
PMT: END BEGIN

PMT
$5368.22

Homework

Pg. 453 #C2,2bc,4-6,8,11,12a

(Graphing Calculator 4-6)



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