



Approved Prep  
Provider



CFA Institute

# Texas Instruments BA II Plus Tutorial

Presented by Arif Irfanullah, CFA

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# Part 1 Contents

1. Setup: floating decimal, payments per year
2. Future value of single payment (annual compounding)
3. Future value of single payment (quarterly compounding)
4. Future value of single payment (continuous compounding)
5. Present value of single payment (annual compounding)
6. Present value of single payment (continuous compounding)
7. Compute I/Y given PV, FV and N
8. Nominal and effective rates

# Setup

Key Strokes	Explanation	Display
[2nd] [FORMAT]	Get into format mode	DEC = 2
9 [ ENTER ]	<b>Set to floating decimal</b>	DEC = 9
[2nd] [QUIT]	Return to standard calculator mode	0

Key Strokes	Explanation	Display
[2nd] [P/Y]	<b>Set payments per year</b>	12.00
1 [ ENTER ]	Set to 1 payment per year	1.00
[2nd] [QUIT]	Return to standard calculator mode	0

# Future Value of Single Payment (Annual Compounding)

Invest \$100 today at 10% compounded annually.  
How much will this become after 5 years?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
5 [N]	Five years/periods	N = 5
10 [I/Y]	Set interest rate	I/Y = 10
100 [PV]	Set present value	PV = 100
0 [PMT]	Set payment	PMT = 0
[CPT] [FV]	Compute future value	-161.051

# Future Value of Single Payment (Quarterly Compounding)

Invest \$100 today at 10% compounded quarterly.  
How much will this become after 5 years?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
20 [N]	Five years/periods	N = 20
2.5 [I/Y]	Set interest rate	I/Y = 2.5
100 [PV]	Set present value	PV = 100
0 [PMT]	Set payment	PMT = 0
[CPT] [FV]	Compute future value	-163.861

# Future Value of Single Payment (Continuous Compounding)

Invest \$100 today at 10% compounded continuously.  
How much will this become after 5 years?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
0.5 [2nd] [e <sup>x</sup> ]	Compute $e^{rT}$	1.6487
X 100		164.87

# Present Value of Single Payment (Annual Compounding)

You will get \$161.05 in 5 years. Interest rate is 10%.  
What is the present value?

Key Strokes	Explanation	Display
[2 <sup>nd</sup> ] [QUIT]	Return to standard calculator mode	0
[2 <sup>nd</sup> ] [CLR TVM]	Clear TVM Worksheet	0
5 [N]	Five years/periods	N = 5
10 [I/Y]	Set interest rate	I/Y = 10
0 [PMT]	Set payment	PMT = 0
161.05 [FV]	Set future value	FV = 161.05
[CPT] [PV]	Compute present value	-99.999

# Present Value of Single Payment (Continuous Compounding)

You will get 164.87 after 5 years. How much is this worth today.  
Assume continuous compounding with a stated rate of 10%?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
0.5 [+/-] [2nd] [e <sup>x</sup> ]	Compute $e^{-rT}$	0.60653
X 164.87		99.9987



# Compute I/Y Given PV, FV and N

Invest \$100 today and get 161.05 in 5 years.  
What is the interest rate?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
5 [N]	Five years/periods	N = 5
100 [PV]	Set present value	PV = 100
0 [PMT]	Set payment	PMT = 0
161.05[+/-] [FV]	Set future value	FV = -161.05
[CPT] [I/Y]	Compute interest rate	I/Y = 10

# Nominal and Effective Rates

Calculate EAR for:

12% with quarterly compounding

12% with continuous compounding

Key Strokes	Explanation	Display
[2nd] [ICONV]	Enter interest rate conversion mode	NOM = 0
[2nd] [CLR WRK]	Clear previously stored values	NOM = 0
[12] [ENTER]	Enter nominal rate = 12	NOM = 12
[↑] [4] [ENTER]	Enter compounding frequency = 4	C/Y = 4
[↑] [CPT]	Compute effective rate	EFF = 12.55

Tip: For continuous compounding enter a high value for C/Y, for example C/Y = 10,000

## Part 2 Contents

1. Future value of ordinary annuity
2. Future value of annuity due
3. Present value of ordinary annuity
4. Present value of annuity due
5. Compute PMT given PV, I/Y and FV
6. Present value given I/Y, PMT and FV
7. NPV for uneven cash flow
8. IRR for uneven cash flow

# Future Value of Ordinary Annuity

You plan to invest \$100 at the end of every year for the next three years.  
What is the future value at the end of 3 years assuming an interest rate of 10%?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
3 [N]	Five years/periods	N = 3
10 [I/Y]	Set interest rate	I/Y = 10
0 [PV]	Set present value	PV = 0
100 [PMT]	Set payment	PMT = 100
[CPT] [FV]	Compute future value	-331

# Future Value of Annuity Due

You invest \$100 now, \$100 at the end of year 1 and \$100 at the end of year 2.  
The interest rate is 10%. What is the future value at the end of 3 years?

Key Strokes	Explanation	Display
[2nd] [BGN] [2nd] [SET]	Puts in BGN mode	0
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clears TVM Worksheet	0
3 [N]	Five years/periods	N = 3
10 [I/Y]	Set interest rate	I/Y = 10
0 [PV]	Set present value	PV = 0
100 [PMT]	Set payment	PMT = 100
[CPT] [FV]	Compute future value	-364.1

Tip: Switch back to END mode.

# Present Value of Ordinary Annuity

You will get \$100 at the end of every year for 3 years.

What is the present value assuming an interest rate of 10%?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
3 [N]	Five years/periods	N = 3
10 [I/Y]	Set interest rate	I/Y = 10
0 [FV]	Set future value	FV = 0
100 [PMT]	Set payment	PMT = 100
[CPT] [PV]	Compute present value	-248.685

# Present Value of Annuity Due

You get \$100 now and then again at the end of year 1 and year 2.  
What is the present value assuming an interest rate of 10%?

Key Strokes	Explanation	Display
[2nd] [BGN] [2nd] [SET]	Put calculator in BGN mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
3 [N]	Five years/periods	N = 3
10 [I/Y]	Set interest rate	I/Y = 10
0 [FV]	Set future value	FV = 0
100 [PMT]	Set payment	PMT = 100
[CPT] [PV]	Compute present value	-273.55

# Compute Payments Given PV, I/Y and FV

You borrow \$100,000 at 6% and need to make monthly payments over thirty years.  
What is your monthly payment amount?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
30 x 12 = [N]	Five years/periods	N = 360
6 ÷ 12 = [I/Y]	Set interest rate	I/Y = 0.5
100,000 [PV]	Set present value	PV = 100,000
0 [FV]	Set future value	FV = 0
[CPT] [PMT]	Compute monthly payments	-599.55



# Present Value Given Payments and Future Value

You will receive \$100 at the end of every year for five years. In addition you will get \$1,000 at the end five years. The interest rate is 8%. What is the present value?

Key Strokes	Explanation	Display
[2nd] [QUIT]	Return to standard calculator mode	0
[2nd] [CLR TVM]	Clear TVM Worksheet	0
5 [N]	Set number of periods	N = 5
8 [I/Y]	Set interest rate per period	I/Y = 8
100 [PMT]	Set payment	PMT = 100
1000 [FV]	Set future value	FV = 1000
[CPT] [PV]	Compute present value	-1079.85

# NPV for Uneven Cash flow

Year	0	1	2	3	4
Cash flow	<b>-100</b>	-50	100	0	200

Key Strokes	Explanation	Display
[CF] [2nd] [CLR WRK]	Clear CF Register	CF0 = 0
100 [+/-] [ENTER]	Initial Outlay	CF0 = -100
[↓] 50 [+/-] [ENTER]	Period 1 CF	C01 = -50
[↓][↓] 100 [ENTER]	Period 2 CF	C02 = 100
[↓][↓] 0 [ENTER]	Period 3 CF	C03 = 0
[↓][↓] 200 [ENTER]	Period 4 CF	C04 = 200
[↓] [NPV] 10 [ENTER]	Set Interest Rate	I = 10
[↓] [CPT]	Compute NPV	NPV = 73.79

# IRR for Uneven Cash flow

Year	0	1	2	3	4
Cash flow	<b>-100</b>	-50	90	90	90

Key Strokes	Explanation	Display
[CF] [2nd] [CLR WRK]	Clear CF Register	CF0 = 0
100 [+/-] [ENTER]	Initial Outlay	CF0 = -100
[↓] 50 [+/-] [ENTER]	Period 1 CF	C01 = -50
[↓] [↓] 90 [ENTER]	Period 2 CF	C02 = 90
[↓] 3 [ENTER]	Frequency	F02 = 3
[↓] [IRR] [CPT]	Compute IRR	IRR = 25.189

# Part 3 Contents

1. Standard deviation of a population and sample
2. Expected value and standard deviation of a random variable
3. Factorial, permutations and combinations
4. STO, RCL
5. Backspace
6. Exponent ( $Y^x$ )

# Standard Deviation for Population and Sample

15	-5	12	22
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Key Strokes	Explanation	Display
[2nd] [DATA]	Enter data mode	X01
[2nd] [CRL WORK]	Clear data registers	X01
15 [ ENTER ]	Enter 1 <sup>st</sup> value	X01 = 15
[↓][↓] 5 [+/-] [ENTER]	Enter 2 <sup>nd</sup> value	X02 = -5
[↓][↓] 12 [ENTER]	Enter 3 <sup>rd</sup> value	X03 = 12
[↓][↓] 22 [ENTER]	Enter 4 <sup>th</sup> value	X04 = 22
[↓] [2nd] [STAT]	Puts calculator into stats mode.	
[2nd] [SET] repeatedly	Press repeatedly till you see →	1-V
[↓]	Number of data points	n = 4
[↓]	Mean	X = 11
[↓]	Sample standard deviation	S <sub>x</sub> = 11.46
[↓]	Population standard deviation	σ <sub>x</sub> = 9.92

# Expected Value & Standard Deviation of a Random Variable

State of Economy	Probability	EPS
Good	0.4	\$9
Average	0.5	\$6
Weak	0.1	\$1

Keystrokes	Explanation	Display
[2nd] [DATA]	Enter data entry mode	
[2nd] [CLR WRK]	Clear data registers	X01
9 [ENTER]	1 <sup>st</sup> possible value of random variable	X01 = 9
[↓] 40 [ENTER]	Probability of 40% for X01	Y01 = 40
[↓] 6 [ENTER]	2 <sup>nd</sup> possible value of random variable	X02 = 6
[↓] 50 [ENTER]	Probability of 50% for X02	Y02 = 50
[↓] 1 [ENTER]	3 <sup>rd</sup> possible value of random variable	X03 = 1
[↓] 10 [ENTER]	Probability of 10% for X03	Y03 = 10
[2nd] [STAT]	Puts calculator into stats mode.	
[2nd] [SET]	Press repeatedly till you see →	1-V
[↓]	Total number of entries	N = 100
[↓]	Expected value of random variable	X = 6.7
[↓]	Sample standard deviation	Sx = 2.38
[↓]	Population standard deviation	$\sigma_x = 2.37$

# Factorial, Permutations and Combinations

## Factorial

Example: Keystrokes for  $4!$ : ***4 2ND x!***

## Permutations

Example: Keystrokes for  $6P2$ : ***6 2ND nPr 2 =***

## Combinations

Example: Keystrokes for  $6C2$ : ***6 2ND nCr 2 =***

# STO, RCL, Backspace and Exponent

Store and recall

Backspace

Exponent

Example:  $1.04^3$  Keystrokes: **1.04 Y<sup>x</sup> 3 =**



*Thank you!*



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