Time Value of Money (Chapter 3 & 4) Tip Sheet

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Present Value of Cash Flow

PV of Cash Flow: PV = $\frac{FV}{(1+r)^n}$

FV = Future Value
PV = Present Value
n = Amount of Periods
r = Interest Rate

Tip: Use Financial Calculator Compound Interest Function

Future Value of Cash Flow

FV of Cash Flow: FV = PV × $(1 + r)^n$

FV = Future Value
PV = Present Value
n = Amount of Periods
r = Interest Rate

Tip: Use Financial Calculator Compound Interest Function
Tip: Input "**PV**" as a negative, so **FV** is Positive

Present Value of Cash Flow Stream

Characteristic: Payments can be different values each year
Characteristic: Payments do not go on forever
Characteristic: Use Financial Calculator Cash Flow Function

PV Cash Flow Stream: NPV = PV + $\frac{C_1}{(1+r)}$ **+** $\frac{C_2}{(1+r)^2}$ **+. .+** $\frac{C_n}{(1+r)^n}$

PV = Present Value
C_1= Cash Flow in Year 1
C_2= Cash Flow in Year 2
C_n= Cash Flow in Year n
n = Amount of Periods
r = Interest Rate

Tip: When inputting values into Cash Flow Section on Financial Calculator: **Sub 1 = Year 0, Sub 2 = Year 1, Sub 3 = Year 2, Sub 4 = Year 3, Sub 5 = Year 4, Sub 6 = Year 5**

Present Value Perpetuity (Normal & Growing)

Characteristic: Payments same value each year (Constant)
Characteristic: Payments go on forever
Characteristic: Use Perpetuity Formula

PV of Perpetuity: PV = $\frac{C}{r}$

C = Constant Cash Flow
r = Interest Rate

PV of Growing Perpetuity: PV = $\frac{C}{r-g}$

C = Constant Cash Flow
r = Interest Rate
g = Growth Rate

Tip: If you have no **Growth** use PV of Perpetuity Formula
Tip: If you have **Growth** use PV Growing Perpetuity Formula

Annuity (Present and Future Value)

Characteristic: Payments same value each year (Constant)
Characteristic: Payments do not go on forever
Characteristic: Use Financial Calculator Compound Interest Function

Present Value of Annuity: PV = C × $\frac{1}{r}(1 - \frac{1}{(1+r)^n})$

PV = Present Value
C = Constant Cash Flow
n = Amount of Periods
r = Interest Rate

Future Value of Annuity: FV = C × $\frac{1}{r}$ $[(1 + r)^n - 1]$

FV = Future Value
C = Constant Cash Flow
n = Amount of Periods
r = Interest Rate

Tip: If you are calculating for **PV** in Financial Calculator, Input "**PMT**" as a Positive

Tip: If you are calculating for **FV** in Financial Calculator, Input "**PMT**" as a Negative

Growing Annuity (Present and Future Value)

Characteristic: Payments same value each year (Constant)
Characteristic: Payments do not go on forever
Characteristic: Use Growing Annuity Formula

PV of Growing Annuity: PV = C × $\frac{1}{r-g}(1 - (\frac{1+g}{1+r})^n)$

C = Constant Cash Flow
n = Amount of Periods
r = Interest Rate
g = Growth Rate

FV of Growing Annuity: FV = C × $\frac{1}{r-g}[(1 + r)^n - (1 + g)^n]$

C = Constant Cash Flow
n = Amount of Periods
r = Interest Rate
g = Growth Rate

Tip: To Calculate **PV of Growing Annuity**, do "C × $\frac{1}{r-g}$" first, do "$(1 - (\frac{1+g}{1+r})^n)$" second and lastly multiple together

Tip: To Calculate **FV of Growing Annuity**, do "C × $\frac{1}{r-g}$" first, do "$[(1 + r)^n - (1 + g)^n]$" second and last together