# This Tutorial Series Will Cover the Following Midterm Topics:

# Time Value of Money:

Type of Cash Flows Streams:

- Single Dollar
- Annuity
- Combined Questions (Single Dollar/Annuity Cash Flows)
- Annuity Due
- Delayed Annuity
- Growing Annuity
- Perpetuity
- Growing Perpetuity
- Irregular Cash Flows
- Mortgage Problems

# Working with Interest Rates

- APR
- EAR
- Period Rates

# <u>Bonds</u>

- Bond Basics Theory
- Discount Bond vs. Premium Bond
- Bonds Solve for the Coupon Rate
- Bonds Rate of Return (Bonds held for one year)
- Bonds Rate of Return (Bonds held for multiple years)

# <u>Stocks</u>

- Stock Basics Theory
- Stock Price Dividend Discount Model
- Stock Price Constant Growth Dividend Discount Model
- Stock Price Constant Dividend
- Stock Dividend Yield

# Learn Calculator Tips!

# TVM: Time Value of Money

When valuing cash flows we will use the following inputs as described below for the TVM variables; either on the calculator or in the mathematical equations.

# • Number of Periods (N)

This is the number of time periods that we want to move the cash flow. N is not the number of years but rather N must be the total # of compounding periods.

# • Interest Rate per Year (I/Y)

This tells the calculator the interest rate per year. The interest rate quoted in questions can be either an EAR, APR or Period Rate. More on this will come later.

#### • Present Value (PV)

This tells us the present value of the cash flow in a particular timeline.

# • Future Value (FV)

This tells us the future value of the cash flow.

#### • Payment (PMT)

This represents the value of an annuity cash flow.

# • Growth Rate (g)

This represents the rate at which the cash flow is changing over time. This variable does not exist on the calculator, therefore every time a problem involves a growth rate, we must solve it mathematically.

# Single Dollar Cash Flows

#### Example 1 - Solve for Future Value

What is the future value of \$1,000 invested today for 5 years in an investment account earning 5% compounded annually?

#### Example 2 - Solve for Present Value

If you know that you want \$5,000 saved for a new car purchase in 5 years, what should you invest now if current rates are 5% compounded annually?

#### Example 3 - Solve for Interest Rate

If I promise to pay you \$5,500 twelve years from now in return for a loan of \$1,000 today, what is the effective annual interest rate (compounded annually) for this agreement?

#### Example 4 - Solve for Number of Periods

If you plan to deposit \$5,000, how many years would it take until you have \$10,000 saved if interest rates are 5% compounded annually?

# Annuity Cash Flows

#### Example 5 - Solve for Future Value

How much can be accumulated for retirement if \$15,000 is deposited annually and the account earns 8% interest compounded annually for 4 years?

#### Example 6 - Solve for Present Value

What is the present value of an annuity of four annual payments of \$8,000 if the appropriate interest rate is 8% compounded annually?

# Example 7 - Solve for Annuity Payments (PMT)

If you need \$1,000,000 saved up for when you retire in 20 years, how much do you need to deposit in a savings account annually if interest rates are 8% compounded annually?

# Example 8 - Solve for Interest Rate

If you plan to make 10 equal payments of \$1,500 to pay off a loan of \$10,000, what is the effective annual rate (compounded annually) of this loan?

# Example 9 - Solve for the Number of Periods (n)

You want to save up \$100,000 for the purchase of a new home by depositing \$12,000 in a bank account annually. How many years/periods would it take to accomplish this goal if the interest rates are 8% compounded annually?

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