CONCEPT: TIME VALUE OF MONEY EQUATIONS

PRE-TEST: It's my money and I want it _____! a) Now b) Some other time

● A dollar ***today*** is worth more than a dollar ***tomorrow***. The two main concepts in Time Value of Money (TVM) are:

- □ _____: Taking current money and earning _____ as time passes into the future
- □ _____: Taking a future sum of money and removing _____ to find its value today

● ***Timelines*** are a helpful tool to visualize the timing of cash flows at different points in time:

EXAMPLE: Today, you invest **$100** at Clutch Bank at a **10%** interest rate for **three years**.

The Time Value of Money Equation:

$FV = PV * (1 + r)^n$
● FV = _____ = The value of a current amount of money at a future date
● PV = _____ = The current value of a sum of money (i.e. the PV of $1,000 today is $1,000)
● r = _____ = The _____ interest rate expressed as a decimal
● n = _____ = The amount of time passing between the PV and FV

PRACTICE: The formula $FV = PV * (1 + r)^n$ is best used for:

a) Compounding
b) Discounting
c) Rebounding
d) Converting

PRACTICE: You invest $4,545 in Clutch Bank today earning a juicy 10% annual interest. What is the value of your investment in one year? What is the value of the investment after two years?

● Using a little bit of algebra, we can rearrange the time value of money formula:

$$FV = PV * (1 + r)^n$$

PRACTICE: The formula $PV = \frac{FV}{(1+r)^n}$ is best used for:

a) Compounding
b) Discounting
c) Rebounding
d) Converting

PRACTICE: You are saving up $12,000 for a luxurious European vacation two years from now. How much money would you need to invest today at Clutch Bank, earning their juicy 10% annual interest, to have enough for your vacation?

How much would you need to invest today, if instead you could only earn 6% interest?

● The formulas we have used so far are for finding the value of a _____ of money.

□ _____: Payments of the same amount of money at regular intervals (i.e. annually)

□ The formulas for calculating PV and FV of an annuity are beyond the scope of this course.

- We use PV and FV tables to find the values of lump-sums and annuities.

EXAMPLE: You have reached retirement and have earned a pension that will pay you $10,000 annually for the next five years. Visualize this information on a timeline.

PRACTICE: Today, you purchased a $1,000 bond that matures in 5 years. The bond pays annual interest of 10%. Visualize these cash flows on a timeline.