ST. JEAN DE BREBEUF MATHEMATICS

CHAPTER 8.1

SIMPLE and COMPOUND INTEREST

CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

KEY CONCEPTS

Simple interest is calculated using the formula

$$I = Prt.$$

Money invested with simple interest grows by adding the interest to the principal

FORMULA: $A = P + Prt$ **or** $A = P + I$

For *both* formulas:

***A* =** Final amount (or Future Value)

P = Principal amount or investment

r = Interest rate *per year (per annum)*

***t* =** *time (in years)*

The rate of change for simple interest is the interest being added to the principal, so it is **linear growth**.

CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

KEY CONCEPTS

Compound interest occurs when the interest is added to the principal at the end of each compounding period, and is included in further calculations of interest.

Money invested with compound interest grows by multiplying by the **growth factor 1 + *i***, so it is **exponential growth**.

FORMULA $A = P(1+i)^n$

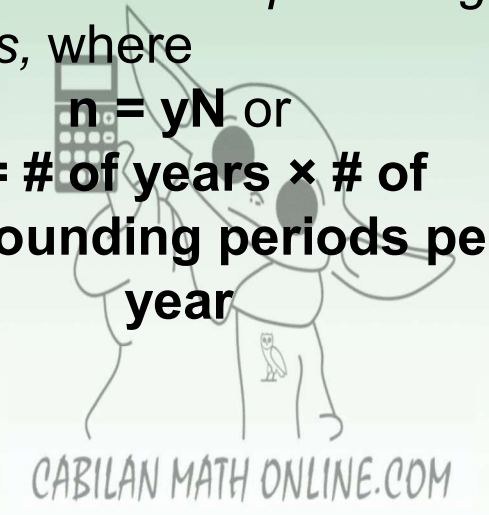
A **=** Final amount (or Future Value)
P = Principal amount or investment

i = Interest rate *per compounding period,* where

$i = \frac{r}{N}$ or $i = \frac{Interest\ rate\ per\ year}{\#of\ compounding\ periods\ per\ year}$

n **=** *Total # of compounding periods,* where

n = yN or
n = # of years × # of compounding periods per year



CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

KEY CONCEPTS

Compound interest occurs when the interest is added to the principal at the end of each compounding period, and is included in further calculations of interest.

Money invested with compound interest grows by multiplying by the **growth factor 1 + *i***, so it is **exponential growth**.

FORMULA $A = P(1+i)^n$

A **=** Final amount (or Future Value)
P = Principal amount or investment

i = Interest rate *per compounding period,* where

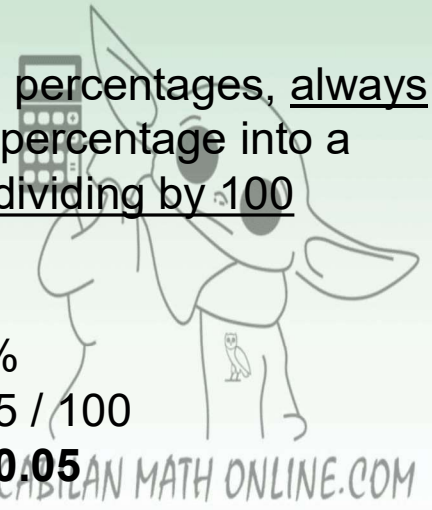
$i = \frac{r}{N}$ or $i = \frac{Interest\ rate\ per\ year}{\#of\ compounding\ periods\ per\ year}$

REMEMBER...

When using percentages, always change the percentage into a *decimal* by dividing by 100

EXAMPLE:

5%
= 5 / 100
= **0.05**



CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

EXAMPLE *Simple vs. Compound Interest*

Lawrence wants to invest **$500** for **ten years**.

Compare the growth of his $500 investment at:

4 / 100
= **0.04**

(i) **4%** per year, **simple interest**

P = **500**

r = **0.04**

t = **10**

Step 1: Find the interest amount

$$I = \Pr t$$
$$I = 500(0.04)(10)$$
$$I = \$200$$

Step 2: Add the Interest to the Principal amount

$$A = P + I$$
$$A = 500 + 200$$
$$\boxed{A = \$700}$$

Lawrence will have **$700** after 10 years at 4% per year, simple interest.

CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

EXAMPLE *Simple vs. Compound Interest*

Lawrence wants to invest **$500** for **ten years**.

Compare the growth of his $500 investment at:

4 / 100
= **0.04**

(ii) **4%** per year, **compounded *annually***.

Method 1: Using the formula $A = P(1 + i)^n$

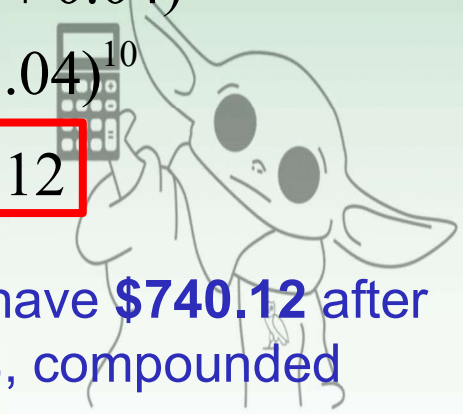
P = **500**

i = r / N
= 0.04 / 1 ← *Represents **annually** (once per year)*
= **0.04**

n = yN
= 10(1)
= **10**

$$A = P(1+i)^n$$
$$A = 500(1+0.04)^{10}$$
$$A = 500(1.04)^{10}$$
$$A = \$740.12$$

Lawrence will have **$740.12** after 10 years at 4%, compounded annually



CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

EXAMPLE *Simple vs. Compound Interest*

Lawrence wants to invest **$500** for **ten years**.

Compare the growth of his $500 investment at:

(ii) **4%** per year, **compounded *annually***.

4 / 100 = **0.04**

Method 2: Using a chart

P = **500**

i = r / N
= 0.04 / 1
= **0.04**

Year	A = P(1 + i)	Amount
0		$500
1	A = **500**(1 + **0.04**)	$520
2	A = **520**(1 + **0.04**)	$540.80
3	A = **540.80**(1 + 0.04)	**$562.43**
4	A = **562.43**(1 + 0.04)	**$584.93**
5	A = **584.93**(1 + 0.04)	**$608.33**
6	A = **608.33**(1 + 0.04)	**$632.66**
7	A = **632.66**(1 + 0.04)	**$657.97**
8	A = **657.97**(1 + 0.04)	**$684.29**
9	A = **684.29**(1 + 0.04)	**$711.66**
10	A = **711.66**(1 + 0.04)	**$740.13**

CHAPTER 8.1 SIMPLE and COMPOUND INTEREST

Homework:

Page 428 – 429

#1 – 9