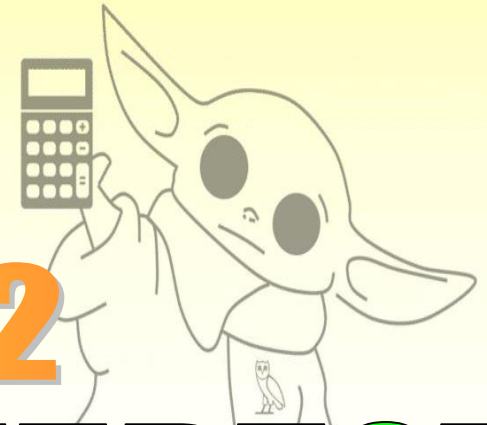


# ST. JEAN DE BREBEUF MATHEMATICS



## CHAPTER 8.2

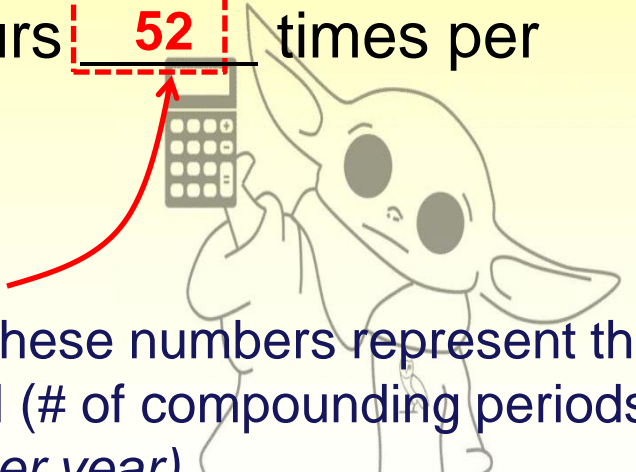
# COMPOUND INTEREST

# CHAPTER 8.2 COMPOUND INTEREST

## REVIEW OF BASIC TERMS

FREQUENCY	DEFINITION	# OF TIMES PER YEAR
YEARLY Commonly known as <b>annually</b>	Every year	<u>1</u> times
MONTHLY	Every month	<u>12</u> times
SEMI-ANNUALLY	Twice a year or every six months	<u>2</u> times
QUARTERLY	Four times a year or every three months	<u>4</u> times

\*\*\***Weekly**, although less common, occurs 52 times per year



These numbers represent the **N** (# of compounding periods per year)

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# CHAPTER 8.2 COMPOUND INTEREST

## KEY CONCEPTS

The **interest earned** can be calculated by subtracting the *Principal* from the *Final amount*

$$\text{Interest earned} = \text{Final amount} - \text{Principal Amount or}$$
$$\mathbf{I = A - P}$$



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# CHAPTER 8.2 COMPOUND INTEREST

## EXAMPLE

### Comparing Compounding Intervals on a Deposit

Alexander wants to deposit **\$2500** into a Savings account and he is presented with various options. Complete the table below to determine which option would earn him the most money after **7 years**.

$$\frac{6}{100} = 0.06$$

0.06

$0.06$ 6%, compounded semi-annually <b>2x per year</b> <b>(N = 2)</b>	$0.06$ 6% compounded quarterly <b>4x per year</b> <b>(N = 4)</b>
Interest earned ( $I = A - P$ )	Interest earned ( $I = A - P$ )

# CHAPTER 8.2 COMPOUND INTEREST

## EXAMPLE

### Comparing Compounding Intervals on a Deposit

Alexander wants to deposit **\$2500** into a Savings account and he is presented with various options. Complete the table below to determine which option would earn him the most money after **7 years**.

$$P = 2500$$

$$i = r / N$$

$$= 0.06 / 2$$

$$= 0.03$$

$$n = yN$$

$$= 7(2)$$

$$= 14$$

0.06

6%, compounded semi-annually 2x per year

(N = 2)

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

$$A = 2500(1 + 0.03)^{14}$$

$$A = 2500(1.03)^{14}$$

$$A = \$3781.47$$

Interest earned (I = A - P)

$$I = 3781.47 - 2500$$

$$I = \$1281.47$$

0.06

6% compounded quarterly 4x per year

(N = 4)

Interest earned (I = A - P)

# CHAPTER 8.2 COMPOUND INTEREST

## EXAMPLE

### Comparing Compounding Intervals on a Deposit

Alexander wants to deposit **\$2500** into a Savings account and he is presented with various options. Complete the table below to determine which option would earn him the most money after **7 years**.

$$P = 2500$$

$$i = r / N$$

$$= 0.06 / 4$$

$$= 0.015$$

$$n = yN$$

$$= 7(4)$$

$$= 28$$

0.06

6%, compounded semi-annually **2x per year**

**(N = 2)**

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

$$A = 2500(1 + 0.03)^{14}$$

$$A = 2500(1.03)^{14}$$

$$A = \$3781.47$$

Interest earned ( $I = A - P$ )

$$I = 3781.47 - 2500$$

$$I = \$1281.47$$

0.06

6% compounded quarterly **4x per year**

**(N = 4)**

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

$$A = 2500(1 + 0.015)^{28}$$

$$A = 2500(1.015)^{28}$$

$$A = \$3793.06$$

Interest earned ( $I = A - P$ )

$$I = 3793.06 - 2500$$

$$I = \$1293.06$$

# CHAPTER 8.2 COMPOUND INTEREST

## EXAMPLE

### Comparing Compounding Intervals on a Deposit

Alexander wants to deposit **\$2500** into a Savings account and he is presented with various options. Complete the table below to determine which option would earn him the most money after **7 years**.

$$P = 2500$$

$$i = r / N$$

$$= 0.06 / 12$$

$$= 0.005$$

$$n = yN$$

$$= 7(12)$$

$$= 84$$

0.06

6% compounded monthly  
12x per year

(N = 12)

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

$$A = 2500(1+0.005)^{84}$$

$$A = 2500(1.005)^{84}$$

$$A = \$3800.92$$

This option would earn Alexander the most money after 7 years.

Interest earned ( $I = A - P$ )

$$I = 3800.92 - 2500$$

$$I = \$1300.92$$

\*\*\* The more the compounding periods, the more the final amount!



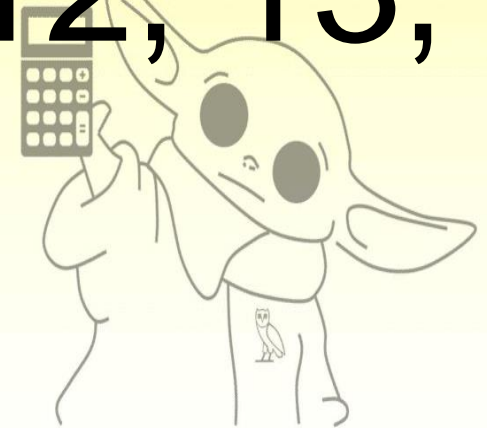


# CHAPTER 8.2 COMPOUND INTEREST

## Homework

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