GRADE 11 ESSENTIAL MATHEMATICS

UNIT B

INTEREST WORKBOOK

NAME _____

Lesson 1 Simple Interest PRE-ALGEBRA

If the rate of interest is 12% a year, what will the interest be on a \$300 loan for $1\frac{1}{2}$ years?

interest = principal × rate × time (in years)

$$i = p \times r \times t$$

$$= 300 \times 0.12 \times \frac{3}{2}$$

$$= 36 \times \frac{3}{2}$$

$$= 54$$

The interest will be \$_____.

If the rate of interest is $9\frac{1}{2}$% a year, what will the interest be on a \$100 loan for 2 years?

$$i = p \times r \times t$$

$$= \_\_\_\_ \times \_\_\_\_ \times \_\_\_\_$$

$$= \_\_\_\_\_ \times \_\_\_\_$$

$$= \_\_\_\_\_$$

The interest will be \$_____.

CHAPTER 6

Find the interest for each loan described below.

	principal	rate	time	interest
1.	\$250	10%	2 years	
2.	\$400	12%	2 years	
3.	\$550	8%	$1\frac{1}{4}$ years	
4.	\$650	$11\frac{1}{2}$%	3 years	
5.	\$600	16%	3 years	
6.	\$500	$11\frac{1}{4}$%	1 year	
7.	\$1500	15%	$1\frac{1}{3}$ years	
8.	\$1000	$12\frac{1}{2}$%	3 years	
9.	\$2890	14%	$2\frac{1}{2}$ years	
10.	\$2600	9%	$2\frac{1}{2}$ years	

Lesson 1 Problem Solving PRE-ALGEBRA

Solve each problem.

1. Mr. Wilkinson borrowed \$600 for $1\frac{1}{2}$ years. He is to pay 9% annual interest. How much interest is he to pay?

   He will pay \$_____ interest.

   1.

2. Hillary had \$350 in a savings account for $\frac{1}{2}$ year. Interest was paid at an annual rate of 5%. How much interest did she receive?

   She received \$_____ interest.

   2.

3. Suppose you deposit \$700 in a savings account at $5\frac{1}{2}$% interest. How much interest will you receive in one year?

   You will receive \$_____.

   3.

4. The Tremco Company borrowed \$10 000 at 12% annual interest for a 1-year period. How much interest did the company have to pay? What was the total amount (principal + interest) the company needed to repay the loan?

   The company had to pay \$_____ interest.

   The total amount needed was \$_____.

   4.

5. Ian borrowed \$700 for 1 year. Interest on the first \$300 of the loan was 18%, and interest on the remainder of the loan was 12%. How much interest did he pay?

   He paid \$_____ interest.

   5.

6. Molly's mother borrowed \$460 at 10% annual interest. What would be the interest if the loan were repaid after $\frac{1}{2}$ year? What would the interest be if the loan were repaid after $\frac{3}{4}$ year?

   The interest would be \$_____ for $\frac{1}{2}$ year.

   The interest would be \$_____ for $\frac{3}{4}$ year.

   6.

NAME _____

Lesson 2 Simple Interest PRE-ALGEBRA

$36 interest is paid in 2 years at a flat rate of 9%. Find the principal.

$i = p \times r \times t$

$36 = p \times 0.09 \times 2$

$36 = 0.18p$

$\frac{36}{0.18} = p$

$200 = p$

The principal is $200.00.

$16 interest is paid in 2 years on $100 principal. Find the rate.

$i = p \times r \times t$

$16 = 100 \times r \times 2$

$16 = 200r$

$\frac{16}{200} = r$

$0.08 = r$

The rate is _____%.

$50 interest is paid on $200 principal at a rate of 10%. Find the time.

$i = p \times r \times t$

$50 = 200 \times 0.10 \times t$

$50 = 20t$

$\frac{50}{20} = t$

$2.5 = t$

The time is _____ years.

CHAPTER 6

Complete the following.

	principal	rate	time	interest
1.		7%	3 years	$21
2.	$325		$1\frac{1}{2}$ years	$39
3.	$375	10%		$18.75
4.	$780	15%	2 years	
5.	$1200	9%		$216
6.	$1400		$1\frac{1}{2}$ years	$168
7.		$8\frac{1}{2}$%	$1\frac{1}{2}$ years	$446.25
8.	$8000		$2\frac{1}{2}$ years	$1500
9.	$18 050	12%		$6498
10.	$25 000	15%	3 years	

Lesson 2 Problem Solving PRE-ALGEBRA

Solve each problem.

1. Mrs. Vernon paid \$72 interest for a 2-year loan at 9% annual interest. How much money did she borrow?

   She borrowed \$_____.

1.

2. Matthew paid \$63 interest for a \$350 loan for $1\frac{1}{2}$ years. What was the rate of interest?

   The rate of interest was _____%.

2.

3. Suppose you borrow \$600 at 10% interest. What period of time would you have the money if the interest is \$30?

   The period of time would be _____ year.

3.

4. Albertito had \$740 in a savings account at 5% interest. The money was in the account for $\frac{1}{4}$ year. How much interest did he receive? Suppose he withdrew the principal and interest after $\frac{1}{4}$ year. How much money would he withdraw from the account?

   He received \$_____ interest.

   He would withdraw \$_____ from the account.

4.

5. How much must you deposit at $5\frac{1}{2}$% annual interest in order to earn \$33 in 1 year?

   You would need \$_____ in the account.

5.

6. The interest on a \$300 loan for 2 years is \$90. What rate of interest is charged?

   The rate of interest is _____%.

6.

7. How much must you have on deposit at $6\frac{1}{2}$% of annual interest in order to earn \$221 in a year?

   You would have to deposit \$_____.

7.

NAME _____

Lesson 3 Compound Interest

Interest paid on the original principal and the interest already earned is called compound interest.

Bev had $400 in a savings account for 3 years that paid 6% interest compounded annually. What was the total amount in her account at the end of the third year?

At the end of 1 year:

interest = 400 × 0.06 × 1 = 24.00 or $24

new principal = 400 + 24 = 424 or $424

At the end of 2 years:

interest = 424 × 0.06 × 1 = 25.44 or $25.44

new principal = 424 + 25.44 = 449.44 or $449.44

At the end of 3 years:

interest = 449.44 × 0.06 × 1 = 26.9664 or $26.97

total amount = 449.44 + 26.97 = 476.41 or $_____

CHAPTER 6

Assume interest is compounded annually. Find the total amount for each of the following.

	principal	rate	time	total amount
1.	$500	6%	2 years	
2.	$700	$5\frac{1}{2}\%$	2 years	
3.	$800	5%	3 years	
4.	$800	$6\frac{1}{2}\%$	3 years	
5.	$200	9%	3 years	
6.	$1000	8%	2 years	

Lesson 3 Problem Solving

Solve each problem.

1. Heidi had $600 in a savings account for 2 years. Interest was paid at the rate of 6% compounded annually. What was the total amount in her account at the end of 2 years?

   The total amount was $_____.

1.

2. Travis deposited $400 in an account that pays 5% interest compounded annually. What will be the total amount in his account after 2 years? After 3 years?

   It will be $_____ after 2 years.

   It will be $_____ after 3 years.

2.

3. Aubrey deposited $300 in an account that pays 7% interest compounded annually. Tori deposited $300 in an account at an annual rate of 7% (simple interest). After 3 years what will be the total amount in Aubrey's account? In Tori's account?

   Aubrey's account will have $_____.

   Tori's account will have $_____.

3.

4. Ms. Sanchez has $500 in her savings account, which pays 5% interest compounded annually. What will be the value of the account after 3 years?

   The value will be $_____.

4.

5. Landon deposited $300 at 6% interest compounded annually. Elisa deposited $200 at $6\frac{1}{2}$% interest compounded annually. Who will have the greater account after 3 years? How much greater will it be?

   _____ will have the greater account.

   It will be $_____ greater.

5.

NAME _____

Lesson 4 Compound Interest

Interest may be paid annually (each year), semiannually (twice a year), quarterly (four times a year), monthly (every month), or daily (every day).

Ed had \$100 in an account for $1\frac{1}{2}$ years that paid 6% interest compounded semiannually. What was the total amount in his account at the end of $1\frac{1}{2}$ years?

At the end of $\frac{1}{2}$ year:

interest = $100 \times 0.06 \times \frac{1}{2} = 3.00$ or \$3

new principal = $100 + 3 = 103$ or \$103

At the end of 1 year:

interest = $103 \times 0.06 \times \frac{1}{2} = 3.09$ or \$3.09

new principal = $103 + 3.09 = 106.09$ or \$106.09

At the end of $1\frac{1}{2}$ years:

interest = $106.09 \times 0.06 \times \frac{1}{2} = 3.1827$ or \$3.18

total amount = _____ + _____ = _____ or \$_____

CHAPTER 6

Find the total amount for each of the following.

	principal	rate	time	compounded	total amount
1.	\$200	6%	$1\frac{1}{2}$ years	semiannually	
2.	\$300	5%	2 years	semiannually	
3.	\$100	5%	1 year	quarterly	
4.	\$400	7%	$\frac{3}{4}$ year	quarterly	
5.	\$500	8%	4 months	monthly	
6.	\$600	9%	$\frac{1}{4}$ year	monthly	

Lesson 4 Problem Solving

Solve each problem.

1. Mrs. Fauler had \$600 in a savings account that paid 5% interest compounded semiannually. What was the value of her account after $1\frac{1}{2}$ years?

   The value was \$_____.

1.

2. How much interest would \$3000 earn in two years at 7% interest compounded semiannually?

   It would earn \$_____ interest.

2.

3. Suppose \$100 were deposited in each savings account with rates of interest as follows:
   Account **A**—6% compounded annually
   Account **B**—6% compounded semiannually
   Account **C**—6% compounded quarterly
   What would be the value of each account after 1 year?

   \$_____ will be in account **A.**

   \$_____ will be in account **B.**

   \$_____ will be in account **C.**

3.

4. Assume \$200 was deposited in a 2-year account at 9%. How much more interest would be in the account if the interest were compounded annually rather than computed as simple interest?

   There would be \$_____ more in the account.

4.

5. Account **A** has \$500 at 8% interest compounded quarterly. Account **B** has \$500 at 8% interest compounded semiannually. Which account will have a greater amount of money after 1 year? How much more?

   Account _____ will have more money.

   It will have \$_____ more.

5.

NAME _____

CHAPTER 6 PRACTICE TEST
Simple/Compound Interest

Complete the following for simple interest.

	principal	rate	time	interest
1.	$150	15%	3 years	
2.	$700	$8\frac{1}{2}\%$	2 years	
3.	$645		$\frac{1}{4}$ year	$19.35
4.	$540	10%		$135.00
5.		$9\frac{1}{2}\%$	2 years	$729.60
6.	$1800		2 years	$540.00

Interest is to be compounded in each account below. Find the total amount that will be in each account after the period of time indicated.

	principal	rate	time	compounded	total amount
7.	$300	7%	2 years	annually	
8.	$600	5%	3 years	annually	
9.	$500	6%	2 years	semiannually	
10.	$400	9%	$\frac{1}{4}$ year	monthly	