

Part I: Multiple Choice. Place the correct answer in the corresponding blank at the end of this section.

Formulae: $A = P(1 + rt)$ $A = P(1 + i)^n$

1. Tim borrowed \$1000. How much will he pay back in 3 years if he is charged 4% simple interest?

$A = [1 + 0.04(3)] = \$1120$

- (A) \$1040 (B) \$1120 (C) \$1124.86 (D) \$2200

2. Karen borrowed \$2000. How much will she pay back in 1 year if she is charged 2% compounded semi-annually?

$A = 2000 \left[1 + \frac{0.02}{2} \right]^{1 \times 2} = \2040.20

- (A) \$2040.20 (B) \$2080 (C) \$2080.80 (D) \$2880

3. The interest rate on a loan shown in the chart below is 6.6% compounded monthly. How much of the second payment is the interest toward the loan?

Payment period (month)	Payment (\$)	Principal paid (\$)	Balance (\$)
0			7000
1	400	361.50	6638.50
2	400	363.49	6275.01
3	400	365.49	5909.52

$\$400 - \$363.49 = \$36.51$

- (A) \$34.51 (B) \$36.51 (C) \$38.50 (D) \$109.52

4. 312 semi-monthly payments are required to pay off a loan. How many years does this represent?

$\frac{312}{24} = 13$

- (A) 8 (B) 12 (C) 13 (D) 26

5. $A = 3000(1.04)^{10}$ represents a bank loan that is compounded semi-annually. What is the interest rate?

- (A) 2% (B) 4% (C) 8% (D) 16%

$1 + i = 1.04$
 $i = 1.04 - 1$
 $i = 0.04$

$0.04 \times 2 = 0.08$
 or 8%

6. A credit card offers no interest no payments for 12 months. You make a purchase of \$2500. You make monthly payments of \$200 during the first year. In order to avoid an interest penalty, what would your 12th payment need to be?

$$\$200 \times 11 = \$2200 \therefore \$300 \text{ for last payment}$$

- (A) \$12.50 (B) \$100 (C) \$208.33 (D) \$300

Answers to multiple choice.

- 1.____ 2.____ 3.____ 4.____ 5.____ 6.____

Part II: Constructed Response. Answer each question in the space provided. Show all workings.

7. Vicky wants to borrow money for a trip. Her bank will charge 4.3% compounded quarterly. Vicky wants to pay off the loan in 21 months with one payment of \$10 000.

(A) What is the most that she can borrow?

$$A = 10000$$

$$i = \frac{0.043}{4} = 0.01075$$

$$n = 1.75 \times 4 = 7$$

$$10000 = P(1.01075)^7$$

$$\frac{10000}{1.0777} = \frac{1.0777P}{1.0777}$$

$$P = \$9279.02$$

(B) How much interest will she pay?

$$\begin{array}{r} \$10000.00 \\ - \$9279.02 \\ \hline \$720.98 \end{array}$$

8. The interest rate on a credit card is 19% compounded monthly. Elizabeth made a \$2500 purchase and plans on making maximum payments of \$600 until the balance is paid off. Complete the amortization table.

Payment Period (month)	Payment (\$)	Interest Paid (\$)	Principal Paid (\$)	Balance (\$)
0				2500
1	\$600	39.50	560.50	1939.50
2	\$600	30.64	569.36	1370.14
3	\$600	21.65	578.35	791.79
4	\$600	12.51	587.49	204.30
5		3.23	207.53	0

$$i = \frac{0.19}{12} = 0.015$$

1. $2500 \times 0.015 = 39.50$

$$\begin{array}{r} 600.00 \\ - 39.50 \\ \hline 560.50 \end{array}$$

$$\begin{array}{r} 2500.00 \\ - 560.50 \\ \hline 1939.50 \end{array}$$

(A) What was the final payment made in the 5th month?

$$\$207.53$$

(B) What was the total interest paid?

$$\$107.53$$

9. Tammy signed up for a special offer when she brought a new TV. There were no payments and no interest for 12 months, as long as she paid the balance of \$3400 in full by the end of the first year. Otherwise a penalty equal to an interest rate of 26%, compounded monthly, on the full balance would be charged, starting from when she first borrowed the money.

(A) If Tammy missed the deadline by one day, what would she have to pay?

$$A = 3400 \left(1 + \frac{0.26}{12}\right)^{1 \times 12} = \$4397.34$$

(B) What would the penalty be?

$$\$4397.34 - \$3400 = \$997.34$$

10. Steve is unsure whether to buy or lease a new vehicle.

A 2014 Honda Civic Coupe costs \$26 710 including taxes to buy.



There is 0% interest and \$0 down payment for 5 years

(A) What would be the monthly payment?

$$\frac{\$26710}{60} = \$445.17$$

$$5 \times 12 = 60$$

(B) You can lease for \$150 ²⁶biweekly but it requires a \$3000 down payment.

What would be the total cost of leasing?

$$\$150 \times 26 \times 5 + 3000 = \$22500.00$$

(C) Provide two reasons for leasing a vehicle over purchasing.

- New vehicle every 3, 4 or 5 years
- warranty
- after accident, return vehicle when lease is up.

11. Elijah takes out a 25 year mortgage for \$350000 at a rate of 4.25% compounded monthly. He makes a down payment of \$20000 and regular monthly payments.

(A) Complete the following graphing calculator screenshot for this information.

$$N = 25 \times 12 = 300$$

N =	300
I% =	4.25
PV =	330 000
PMT =	0
FV =	0
P/Y =	12
C/Y =	12
PMT:	END BEGIN

$$\begin{array}{r}
 \$350\,000 \\
 \$\ 20\,000 \\
 \hline
 \$330\,000
 \end{array}$$

(B) Suppose the following values are obtained using the graphing calculator:

$$\mathbf{PMT = -1787.74}$$

By the time is mortgage is paid off, how much interest will Elijah have paid?

$$\$1787.74 \times 300 = \$536\,322.00$$

$$\begin{array}{r}
 \$536\,322.00 \\
 \$\ 330\,000.00 \\
 \hline
 \$206\,322.00
 \end{array}$$