

Unit 9 – Finance (Assignment Package)**Day 1 – Simple Interest**

1. A bank is offering 2.5% simple interest on a savings account. If you deposit \$5000, how much interest will you earn in 1 year?

2. To buy a car, Samira borrowed \$15,000 for 3 years at an annual simple interest rate of 9%.
 - a) How much interest will she pay if she pays the entire loan off at the end of the 3rd year?

 - b) What is the total amount that she will repay?

3. Eddy invested \$6000 in a bond at a yearly rate of 3%. He earned \$1080 in interest. For how long was the money invested?

4. Connor borrowed \$8000 for 4 years for home improvements. If he repaid a total of \$10,320, at what simple interest rate did he borrow the money?

5. Mindy's parents deposited \$5000 into a savings account towards a college fund, when she was born. How much will Mindy have in this account after 18 years at a yearly simple interest of 8.25%?

6. MJ invested \$4000 in an investment at a yearly rate of 2%. He earned \$400 in interest. How long was the money invested?

7. Tony borrowed \$1000 from a buddy and paid him back \$1050 in 6 months. What simple annual interest did Tony pay in this deal?

Day 2 – Compound Interest

1. Edison sold his house and invested \$60,000 into a savings account with an annual interest rate of 3%, compounded annually. How much will Edison have in the account in 4 years?

2. Henrietta wants to invest \$7000 in a savings account that has an annual interest rate of 1.8%. The interest is compounded quarterly. Calculate the amount of money in the account at the end of 4 years.

3. DJ borrowed \$2500 at an annual interest rate of 5.7%, compounded monthly.

a) How much money is owed at the end of 8 years (assuming no payments were made)?

b) How much of this is interest?

4. Michaela invested \$12,000 into an account that offers an annual interest rate of 1.5%, compounded daily. How much interest is accumulated after 10 years?

5. What amount would need to be invested at an annual interest rate of 10.2%, compounded quarterly, to grow to \$10,000 in 5 years?

6. Liza invests a sum of money in a retirement account with a fixed annual interest rate of 6.56%, compounded monthly. After 16 years, the balance reaches \$11,356.39. What was the amount of the original investment?

Day 3 – Investments

1. Using technology, determine the future value of an investment with monthly payments of \$200 for 30 years invested at 4.8%, compounded monthly?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

2. Determine the unknown values:

a) Monthly payments of \$100 for 6 years, compounded monthly. The future value is \$7800.61. What is the interest rate?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

b) A 7 year investment at 3.5% , compounded semi-annually. The future value is \$3927.38. What are the semi-annual payments?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

3. Danesh has invested \$350 at the end of each month, at 7.2%, compounded monthly, for 18 years.

a) What is the investment's future value?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

b) How much interest has he earned ?

4. Fraser, who is currently 16 years old, wants to buy a car when he is 21. He deposits \$600 every 3 months (quarterly) into a savings account that earns 6.8%, compounded quarterly.

a) How much money will he have to buy the car when he turns 21?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

b) How much interest will he have earned?

5. Chad wants to retire in 35 years when he is 55 years old. The plan is to have \$1,000,000 saved. If his investments average 6.9%, compounded monthly, how much does he need to invest each month to reach this goal?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

Day 4 – Loans

1. A new car is purchased with a \$25,000 loan taken out. The loan term is 6 years and the interest rate is 4.99%, compounded monthly.

a) What is the monthly payment?

b) How much interest is paid over the term of the loan?

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|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

2. \$15,000 is still owed on a car loan. The loan has an interest rate of 5%, compounded monthly, and requires monthly payments of \$250 / month. How long will it take to pay the loan off? Answer in years and months.

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

3. Jack and Jill can afford \$1200 / month for a house payment. What size of a home loan (mortgage) can they take out if they plan to finance for 25 years, compounded monthly? This does not include property taxes and insurance which are part of a house payment.

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

4. As of February 2019, BC Government-issued student loans are no longer charged interest. However, interest is charged on the Canada student loan portion of a student loan. A student receives a Canada Student Loan for \$10,000 with a 10 year repayment term and an interest rate of 7%, compounded monthly. Six months after University grad, she will start to be charged and will have to begin repaying the loan. Find the monthly payments if she elects to take 10 years to pay it off.

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

5. The average price of home is approximately \$500,000 (2025). A mortgage lender offers a 25 year (amortization) mortgage at a fixed rate of 4 %, compounded monthly, and requires a 10% down payment.

a) What is the down payment?

b) What is the monthly payment?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

c) What is the TOTAL COST to purchase the home (installment cost)?

d) What is the finance charge?

e) The monthly payment is more than the cost of the mortgage. Property tax and insurance are often factored in on the monthly payment. For example, if the city property taxes are \$3700 / year and home insurance is \$2000 /year, find the actual monthly payment with taxes and insurance included.

f) Some experts recommend that the monthly house payment should be less than 25% of your net monthly income. In order for a young couple to follow this advice, what would be their minimum net monthly income?

Day 5 – Credit Cards

Making a Major Purchase with a Credit Card

You just turned 19 and are excited to get your first credit card and use it to make a purchase. You cannot afford to pay off the entire credit card balance when the monthly statement arrives. As a result, the credit card company will be charging you interest each month until the balance or amount owing is paid. You will assess the time it will take to pay back what you owe and the interest you will pay by making only the minimum required payment and a larger amount.

1. Research and choose a credit card

a) Visit the website of any of the Canadian financial institutions to research credit card choices:

- Royal Bank of Canada, RBC
- Canadian Imperial Bank of Commerce, CIBC
- Toronto Dominion Bank, TD bank
- Bank of Montreal, BMO
- Scotiabank
- President's Choice, etc.

Research 2 credit card offerings. These could be from the same bank or different banks. Use the table below to organize the information.

| <i>Financial institution</i> | <i>Credit Card Name</i> | <i>Annual Fee</i> | <i>Interest Rate on purchases (the usual, not the introductory rate)</i> | <i>Interest Rate on Cash Advances</i> | <i>Benefits/Perks of Card</i> |
|------------------------------|-------------------------|-------------------|--------------------------------------------------------------------------|---------------------------------------|-------------------------------|
| | | | | | |
| | | | | | |

b) Choose the card that best suits your needs from the options. Which one will you choose and why?

2. Make a major purchase (over \$1000 but under \$5000)

- New technology – computer, TV, etc.
- Used car from a dealership
- Etc.

I plan to purchase a _____ which costs \$_____ before taxes (do some research!)

Determine the total cost that will be charged to your credit card, including tax. Do a Google search to help you determine the tax rates on your purchase, as some items don't have both PST and GST – Remember to include BC or Canada in your search. Show your work below.

Total cost of purchase: _____

3. Interest calculations

a) Calculate the amount owing each month for the first 3 months after the grace period for your chosen credit card, assuming you only made the minimum payment. The minimum payment on a credit card is usually around 3% of the outstanding balance. Interest is usually compounded DAILY on credit cards. What was the usual interest rate of your chosen card? _____ %

| Month | Unpaid balance | Balance with interest after 1 month $A = P \left(1 + \frac{r}{n} \right)^n$ Show calculation. Assume 30 days/month so $n = 365$ and $t = \frac{30}{365}$ | Payment required 3% of the balance with interest (Show calculation) | New unpaid balance after payment Becomes next month's unpaid balance |
|-------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1 | | | | |
| 2 | | | | |

| | | | | |
|---|--|--|--|--|
| 3 | | | | |
|---|--|--|--|--|

b) Looking at your unpaid balance after month 3, are you making much progress in paying off your purchase? What are your thoughts on this?

* Visit a Credit Card

c) minimum payment calculator to determine how many years and leftover months it would take you to pay off your purchase if you only ever made the minimum 3% payment. Also determine how much your purchase would cost you, including interest. (Hint: this info is on the screen.)

It would take me _____ years and _____ months to pay off my purchase if I only made minimum payments. In total, this purchase would cost me \$ _____ which means I would pay \$ _____ in interest.

d) Use the TVM Solver to determine how long it would take you to pay off your purchase if you paid \$200 per month rather than only making the minimum payment. Show the numbers you entered into the solver. Also determine how much your purchase cost you in this case, including interest.

| |
|-------------|
| N = _____ |
| I% = _____ |
| PV = _____ |
| PMT = _____ |
| FV = _____ |
| P/Y = _____ |
| C/Y = _____ |

It would take me _____ years and _____ months to pay off my purchase if I paid \$200 per month instead of the minimum payment. In total, this purchase would cost me \$ _____ (show work for this below), which means I would pay \$ _____ in interest.

e) What if you were able to pay off the entire unpaid balance before the end of the grace period (usually 21-30 days after the statement is mailed or emailed to you). Would you owe the credit card any interest on top of the amount you owe back from your purchase?

4. Reflection

a) Many credit cards don't charge an annual fee, while others do. Why would anyone pay an annual fee to use a credit card? Give an example to help explain.

b) Who benefits the most from credit cards – consumers or credit card companies? Explain.

c) Credit cards aren't necessarily "bad". What are the benefits of having a credit card? List at least two.

d) Your best friend just received a credit card and is excited. What advice would you give them about financial responsibility?

Day 6 – Buying vs Leasing

1. Jimbo negotiated the price of a new car to \$32,000. He was offered two options:

- **OPTION A:** The car can be leased for \$380 / month over 42 months with a \$1000 down payment. There is a lease acquisition fee of \$745 and the residual value estimate is \$19,500.
- **OPTION B:** The car can be bought for monthly loan payments over 4 years with a \$2000 down payment. The interest rate is 5% p/a, compounded monthly.

a) Calculate the TOTAL COST to lease then buy out the car.

b) Calculate the monthly payment if he buys the car.

c) Calculate the TOTAL COST to buy the car.

d) Which option is less expensive? By how much?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |

2. Henrietta is buying a new truck for \$45,000. She has \$5000 for a down payment and is considering the following two options:

- **OPTION A:** The truck can be leased for \$576 / month over 36 months with a \$1000 down payment. There is a lease acquisition fee of \$850 and the residual value estimate is \$27,500.
- **OPTION B:** The car can be bought for monthly loan payments over 5 years with a \$5000 down payment. The interest rate is 3.9% p/a, compounded monthly.

a) Calculate the TOTAL COST to lease then buy out the truck.

b) Calculate the monthly payment if she buys the truck.

c) Calculate the TOTAL COST to buy the truck.

d) Which option is less expensive? By how much?

| | |
|------|-------|
| N= | _____ |
| I %= | _____ |
| PV= | _____ |
| PMT= | _____ |
| FV= | _____ |
| P/Y= | _____ |
| C/Y= | _____ |