

1. List some monthly bills and describe ways to save money on each of them.
  - a. Rent  
Split rent with roommates. Buy the property and charge rent to your roommates.
  - b. Utilities  
Don't leave the heat on as high during winter or as cool during summer.
  - c. Internet / TV  
Don't pay for cable TV or Netflix. Ex. watch Youtube instead. Consider accessing the Internet at the public library.
  - d. Food  
Buy cheaper food. Go to the food bank.
  - e. Clothes / entertainment  
Wear the same clothes more often. Buy your clothes second hand.
  - f. Insurance  
Not having insurance is cheaper (but comes with risks). Get rid of your car (take public transit – unless you cannot get to work without a vehicle).
2. How much would you earn in a month after taxes if you work a full-time job at \$25 per hour?  
Assume 8 hours a day:  $8 \times \$25 = \$200$  per day.  $\$200 \times 5 = \$1000$  per week. Assume that you work 4 weeks in a month.  $\$1000 \times 4 = \$4000$  each month (gross pay). Using an online gross vs. net income calculator online we find that the average tax rate is about 20%. The net salary (after taxes) is approximately \$3200.
3. Based on the net monthly income in the question above, how much would you be able to save each month (assume the monthly cost of living is \$2400 for a single bedroom living space)
  - a. Living by yourself?  
 $\$3200 - \$2400 = \$800$
  - b. Can you afford to live in a two-bedroom location by yourself? (research the price difference between a one vs. two-bedroom rental suite)  
Unlikely with outside financial support
  - c. As a rule of thumb, up to what percent of your income should be spent on housing (rent, utilities, etc.)? Up to 30% is considered to be affordable
4. Suppose you work 8 hours a day and 5 days a week and make \$35 per hour. If there are 4 weeks in a month, how much housing can you afford each month? Assume you can spend 30% of your gross pay on housing.  
 $8 \times 5 = 40$  hours in a week.  $40 \times \$35 = \$1400$  per week.  $1400 \times 4 = \$5600$  per week (gross).  $\$5600 \times .30 = \$1680$ . Even professionals can barely afford a single bedroom suite in the lower mainland!
5. You manage to invest a million dollars by the time you retire. If your investments are in a 5% GIC (guaranteed rate) how much do you earn in interest each year?  
\$50,000

6. You finish your Ph. D. with \$200,000 in student loans. If your annual student loan interest rate is 10%:
- How much do you have to pay each year in interest alone?  
\$20,000
  - If you pay this interest amount, how many years will it take for you to pay off your student loans?  
 $\infty$ . You are only paying the interest and are not paying down the original loan amount.
7. Provide a scenario in which a billionaire can quickly go broke. See Bill Hwang documentary. Although Bill Hwang was worth \$20 billion, he borrowed times more than he had. As his stocks crashed he was unable to pay back his lenders.
8. You are a top 3% Youtuber and with your 1.4 million views each month, you make \$17,000 each year in advertising income.
- If you are taxed at a rate of 8%, estimate your daily budget.  
 $17,000 \times 0.92 = \$15,640$   
 $\$15,640 \div 365 \approx \$42.85$  (good luck paying for rent!)
  - Is your channel worth the effort if it makes you less than one-third the median household income?  
It depends on how much time you are putting into the channel and how much you enjoy doing it.
9. Your turn: You want to buy a pair of shoes that cost \$200. But they are on sale for 60% off! How much do they cost after 12% taxes?  
 $\$200 \times 0.40 = \$80$ .  $\$80 \times 1.12 = \$89.60$
10. You owe \$100,000 in student loans but have paid off half of your \$40,000 car. You have \$5000 in credit card debt but have \$15000 in the bank. What is your net worth?  
 $-100,000 + 20,000 - 5000 + 15000 = -\$70,000$
11. Your family restaurant bill comes out to be \$200. Taxes is 12%. You decide to tip 15%. How much do you end up paying in total?  
 $\$200 \times 1.17 \approx \$234$   
Or  $\$200 \times 1.12 = \$224$  (subtotal).  $\$224 \times 1.15 \approx \$257.60$
12. Your turn: What is the best deal?  
Deal A: Pay \$500 for a phone and pay \$20 per month for 24 months  
Deal B: Pay \$0 but pay \$40 per month for 24 months  
Deal C: Pay \$1000 for the phone with no monthly payments  
Deal B is the cheapest
13. What is the growth shape of unpaid debt over time?  
Exponential
14. What is the growth shape of money invested over time?  
Exponential

15. Suppose you have \$50,000 in student loans. The annual interest rate is 10%.
- How much does your debt grow by in 1 year?  
\$5000
  - If you pay this “debt growth” amount each year, how many years will it take to pay off your \$50,000 student loan?  
 $\infty$
16. You have \$100,000 in investments and \$100,000 in student loans.
- What is your net worth?  
\$0
  - Why should you pay off your student loans?  
Because risk has a real cost.
17. Enrichment: If you invest two Starbucks drinks a day (each drink \$7) how much does your investment grow to be in 50 years (8% interest rate) according to the “get smarter about money compound interest calculator”?  
> \$3 million!
18. You borrow \$10,000 for 3 years at 10% interest.
- Use the simple interest formula  $I = P \times r \times t$  to roughly estimate how much you owe in 3 years.  
\$13,000
  - Now recalculate the new interest at the end of each year. How much do you need to pay at the end of 3 years?  
Year 1:  $\$10,000 \times 1.10 = \$11,000$   
Year 2:  $\$11,000 \times 1.10 = \$12,100$   
Year 3:  $\$12,100 \times 1.10 = \$13.200$
19. Being desperate for cash you borrow \$1000 from a Payday Loan company. Each year they charge 500% annual interest. How much does your debt grow to be in 3 years?  
After 1 year:  $\$1000 \times 5 = \$5000$   
After 2 years:  $\$5000 \times 5 = \$25,000$   
After 3 years:  $\$25,000 \times 5 = \$125,000$
20. You owe \$100,000 in student loans. Suppose the interest rate is 10%
- How much do you owe at the end of year 1?  
\$10,000
  - How much do you owe at the end of year 2?  
 $\$110,000 \times 1.10 \approx \$121,000$
  - Use the simple interest formula  $I = P \times r \times t$  to calculate how much you owe after 10 years without paying off the \$5000 initial balance.  
 $I = \$100,000 \times (0.10) \times 10 \approx \$100,000$   
Thus  $\$100,000 + \$100,000 = \$200,000$  is owed according to the simple interest formula

d. Challenge: In reality, how much will you owe after 10 years?

$$A = P \left(1 + \frac{i}{n}\right)^{nt} \quad n = 365 \text{ (interest is compounded daily)}$$

$$A = \$100,000 \left(1 + \frac{0.10}{365}\right)^{365(10)} \approx \$271,790.96 \text{ which is much more!}$$

21. Suppose you invest in mutual funds that average 7.5% annual growth. You pay the average Canadian MER fee of 2.5%. How much does your \$10,000 investment grow to be in 3 years?

$$\text{Actual annual growth} = 7.5 - 2.5 = 5\%$$

$$\text{After 1 year: } \$10,000 \times 1.05 = \$10500$$

$$\text{After 2 years: } \$10500 \times 1.05 = \$11025$$

$$\text{After 3 years: } \$11025 \times 1.05 = \$11576.25$$