GRADE 12 Applied
UNIT B – PERSONAL FINANCE
PREVIOUS EXAM QUESTIONS
(Answers attached)

Name:_____
Date: _____

Extracted Personal Finance Questions From Past Provincial Exams

Manitoba Education and Training
Winnipeg, Manitoba, Canada

DIRECTIONS

Remember to:

- indicate your input values by writing them in your booklet or printing a copy [ie: manually transcribe a 'screen shot' of your Apps inputs and results]
- if using a technology tool state any assumptions you make
- express your answers in decimal and percentage form to at least the nearest hundredth (two decimal places) when rounding, except for monetary values or when otherwise indicated

Example: 15/19 = 0.52 or 51.72%

Note: Rounding too soon in your solution may result in an inaccurate final answer for which full marks will not be awarded.

Financial Mathematics Formulae

[notice some of these formulae may use different symbols than we use in class or that other references may use]

$$t = \frac{72}{r}$$

$$I = Prt$$

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$Net\ Worth = Total\ Assets - Total\ Liabilities$$

$$Debt - to - equity\ ratio\ (\%) = \frac{(Total\ Liabilities - Mortgage)}{Net\ worth} * 100;\ \text{max } 50\%$$

$$Gross\ Debt\ Service\ ratio\ (\%) = \frac{\begin{pmatrix} Monthly \\ Mortgage \\ Payment \end{pmatrix} + \begin{pmatrix} Monthly \\ Property \\ Taxes \end{pmatrix} + \begin{pmatrix} Monthly \\ Heating \\ Costs \end{pmatrix}}{Gross\ Monthly\ Income} * 100;\ \text{max } 32\%$$

$$Rate\ of\ Return\ \% = \frac{\begin{pmatrix} Current\ Value \\ of\ Portfolio \end{pmatrix} - \begin{pmatrix} Previous\ Value \\ of\ Portfolio \end{pmatrix}}{Previous\ Value\ of\ Portfolio} * 100$$

JANUARY 2016

1. Which of the following is an advantage of buying a house?

A. no maintenance costs
B. no property taxes
C. no down payment required
D. no restrictions on renovations

2. Approximately how many years will it take a $1000.00 investment to double its value at an interest rate of 3.60%, compounded annually?

A. 5 **B.** 7.2 **C.** 20 **D.** 50

3. Bruce is 24 years old. He graduated from college when he was 20 and since then he has worked full-time. He has also made some investments. His financial advisor sends him an update on his investment portfolio below:

Investment Type	Initial Investment	Gain/Loss
low-risk mutual fund	$2,000	+100
Guaranteed investment certificate (GIC)	$6,000	+220
bonds	$4,000	+180

a) What is the overall rate of return on Bruce's investments?
b) Do you think that Bruce's investment portfolio is appropriate for him at this stage of his life? Justify your answer, stating your assumptions.

4. Pedro has a tax-free savings account (TFSA) with a balance of $5000.00. Interest is earned at a rate of 4.00%, compounded monthly. If Pedro contributes $400.00 to the TFSA at the end of every month, how long will it take him to save $20 000.00?

5. Kira purchases a sofa for $1015.87 (taxes included). The department store offers her a promotion of 0% interest with no payments for one year. If Kira does not pay the amount in full within one year, interest will be charged from the date of purchase at an annual rate of 28.80%, compounded monthly.

a) If Kira does not make any payments, what will the department store bill her one year after the date of purchase?
b) State a different compounding period such that the overall cost of the sofa is lower than if the annual interest rate were compounded monthly.

6. Bill and Celine purchase a new home. They obtain a $375,000.00 mortgage amortized over 25 years with their credit union. The initial 5-year term of the mortgage requires monthly payments. Interest is calculated at a rate of 3.25%, compounded semi-annually.

a) Calculate Bill and Celine's mortgage payment.
b) How much will Bill and Celine owe at the end of their 5-year term?
c) Bill and Celine make an additional $10 000.00 payment on the principal at the end of the 5-year term. How much sooner will they pay off their mortgage if they keep the same payments and interest rate over the life of the mortgage?

JUNE 2016

7. The price of a new car is $26,000 (taxes included). It depreciates at a rate of 20% per year. What is the approximate residual value of the car after 3 years?

A. $10 400 **B.** $13 300 **C.** $15 600 **D.** $20 800

8. **Scenarios.**

Scenario 1: A loan of $30,000.00 at an interest rate of 7.00%, compounded monthly for 1 year

Scenario 2: A loan of $30,000.00 at an interest rate of 7.00%, compounded ___??____ for 1 year

Assuming no payments are made, which compounding period frequency in Scenario 2 would result in less interest than in Scenario 1?

A. every two weeks **B.** daily **C.** semi-annually **D.** weekly

9. Mr. and Mrs. Murthy have a total monthly gross income of $6,000.00. They are interested in purchasing a house with a mortgage payment of $1,300.00 per month, annual heating costs of $2,100.00, and annual property taxes of $3,675.00.
Calculate the gross debt service ratio (GDSR). Determine if a bank is likely to offer them a mortgage.

10. List two advantages of leasing a vehicle over buying.

11. Gabrielle wants to buy a cabin at Lac du Bonnet that costs $165,000.00. She has saved $25,000.00 that she will use as a down payment. The bank will give her a 15-year mortgage for the balance at 3.49%, compounded semi-annually.

a) What will Gabrielle's payment be every two weeks?

b) If the cabin appreciates in value an average of 3.00% per year, calculate the appreciated value of the cabin after 10 years.

c) How much equity will Gabrielle have in the cabin after 10 years?

12. At the age of 30, Alfred began investing $350.00 monthly into an investment account at an interest rate of 7.00%, compounded monthly. When he turned 45, the interest rate on this investment decreased to 5.00%, compounded monthly. Alfred plans to continue making monthly investments until he retires at 58.

a) How much money will Alfred have in his account when he retires?

b) Alfred withdraws $2,000.00 per month from his account after he retires. If the interest rate remains at 5.00%, how many months can he withdraw $2,000.00?

c) Alfred's sister, Marianne, retires at the age of 60. Her portfolio is valued at $200,000.00, earning 5.00%, compounded monthly. If Marianne wants the money to last until she is 85 years old, what is the maximum she can withdraw each month?

JANUARY 2017

13. According to the Rule of 72, a reasonable estimate for the time it would take to double an investment of $24,000.00 at an interest rate of 6.00%, compounded monthly is:

A. 3 years **B.** 4 years **C.** 12 years **D.** 18 years

14. Imani is going to buy a car. She can afford monthly payments of $600.00. The dealer offers two financing options:

Option 1: financing over 60 months at a rate of 0.90% compounded monthly
Option 2: financing over 60 months at a rate of 2.90% compounded monthly with an instant rebate of $3000.00 at the time of purchase
Which option allows Imani to purchase a more expensive car?

15. Your friend has $10,000.00 and is considering an investment in stocks, a guaranteed investment certificate (GIC), or rare collectibles. Choose one of the three investments mentioned above and indicate one advantage and one disadvantage for your choice.

16. When she turned 25, Alexa began investing $400.00 monthly into a mutual fund account producing average returns of 6.00%, compounded monthly. Alexa will stop contributing when she retires at age 55.

a) How much money will her investment be worth at retirement?
b) Alexa will withdraw $2,500.00 per month from her account after retiring. If the average return rate stays the same, how old will she be when the account balance is zero?

JUN 2017

17. The Bashir family wants to buy a house. They can afford monthly payments of $1,325.00. The bank offers them an interest rate of 3.25%, compounded semi-annually over 15 years or 25 years.

a) Determine the maximum amount they can borrow if the mortgage is amortized over 15 years.
b) Determine the maximum amount they can borrow if the mortgage is amortized over 25 years.
c) Give one reason why the Bashir family would choose to buy the less expensive house.

18. You are presented with two different investment plans:

Plan A: Invest $1,000.00 every year for 10 years at an interest rate of 6.00%, compounded monthly.
Plan B: Invest a lump sum of $10,000.00 at an interest rate of 6.00%, compounded monthly for 10 years.

a) Determine the value of each investment plan after 10 years.
b) Calculate the total amount of interest earned for each plan.
c) Which plan would you choose? Explain.

19. The Connors are purchasing a condominium that costs $190,000.00. They have $25,000.00 saved for a down payment and will finance the balance at an interest rate of 5.50% for 20 years, compounded semi-annually.

a) Determine their monthly mortgage payment.
b) There are condominium fees of $300.00 per month in addition to the down payment and mortgage payments. Calculate the total amount they will have paid after 5 years.

JAN 2018

20. Salwa bought a new computer system for $6,000.00. She anticipates the value of the system to depreciate at a rate of 15% per year.
What will the computer system be worth at the end of 3 years?

21. Diego plans to move to Portage la Prairie. He has two housing options:

Option 1:
• Buy a house with a monthly mortgage payment of $1,063.65.
• Property taxes are $3,070.00 per year.
Option 2:
• Rent a house for $1,250.00 per month.

a) Determine the total cost of Option 1 at the end of 25 years.
b) How many years will it take for the total cost of renting to equal the total cost of buying the house? [break even point]
c) Explain why Diego might choose to buy the house.

22. Donald and Alex have a combined gross monthly income of $5,500.00. They want to buy a house in a neighbourhood where the average monthly heating cost is $200.00 and monthly property taxes are $325.00.

a) Calculate the maximum monthly mortgage payment they can afford, based on the gross debt service ratio.
b) Based on the maximum monthly mortgage payment in (a), their bank has offered them a 25-year mortgage at an interest rate of 3.50%, compounded semi-annually. If they have saved $20,000.00 for a down payment, what would be the maximum house price they can afford?

Jun 2018

23. The table below shows the value of a luxury vehicle over a two-year period.

Year	Value
0	$58,500
1	$42,100
2	$30,300

The value of this vehicle depreciates at an annual rate of:

A) 72% B) 52% C) 39% D) 28%

24. Johannes wants to apply for a bank loan. Information regarding his financial situation is given below.

- He has a house valued at $225,000.00 with a mortgage of $175,000.00.
- He has a cottage valued at $115,000.00 with a mortgage of $75,000.00.
- He has $9,000.00 in his savings account.
- He owes a total of $25,000.00 on his credit cards.

a) Calculate his net worth.
b) Calculate his debt-to-equity ratio.
c) Based on his debt-to-equity ratio, would the bank lend him money? Explain.

26. Rémi deposited a sum of money into an account 36 years ago that earned an annual interest rate of 8.00%. Today, there is $12,800.00 in his account.
Use the Rule of 72 to estimate the initial amount that Rémi deposited.
[Check your result more accurately with a manual calculation and with a App; you always check anyway don't you?]

27. Mr. Smythe makes a one-time donation to a university. The university decides to invest this money and use only the amount earned in simple interest from the investment to finance a scholarship.

- The initial amount of the donation was $650,000.00.
- The amount earned in simple interest annually is $40,000.00.
- The university awards the scholarship to one student each year.

At what interest rate must the donation be invested to obtain the $40,000.00 needed to award the scholarship each year? [in 'perpetuity']

28. Bonnie and Claude want to buy a house. They can afford monthly payments of $1,125.00. The bank offers them a mortgage at an interest rate of 3.10%, compounded semi-annually, with an amortization period of 25 years.

a) What is the maximum amount of money the bank will lend them for their mortgage?
b) If they have $30,000.00 saved for a down payment, what is the maximum house price they can afford?

29. Bernard is exploring financing options for a new house. The bank offers him a mortgage of $245,827.00 at an interest rate of 3.75%, compounded semi-annually. He has the following payment options:

Option 1: monthly payments of $1,260.00
Option 2: biweekly payments of $630.00

a) How many years will it take Bernard to pay off the mortgage with each option?
b) If Bernard makes biweekly payments instead of monthly payments, how much money will he save?

JAN 2019

30. Eric wants to borrow money from his bank. Which of the following compounding periods results in the least amount of interest paid on the loan?

A) monthly B) semi-annually C) quarterly D) daily

31. Jeannette's new job involves a lot of driving. She wants to lease a new vehicle. Her friend Simon is trying to convince her not to lease.

State two reasons that Simon could use to convince her not to lease.

32. Himesh wants to retire in 35 years. After meeting with his financial advisor, he determines that his portfolio will consist of the following two investments:

Investment 1: $15 000.00 in a mutual fund that earns an interest rate of 6.50%, compounded monthly.

Investment 2: regular biweekly deposits of $180.00 in a tax-free savings account (TFSA), with an interest rate of 3.75%, compounded biweekly. (Assume the initial value of the TFSA is 0.)

a) What will be the value of each investment when Himesh retires?

b) Himesh's goal is to have $500,000.00 in his portfolio by the time he retires. Determine if he will meet his goal. Justify your answer by using your investment values in (a).

33. Kaia purchased a house for $400,000.00. At the time of purchase, she made a down payment of $100,000.00. The remaining balance of the mortgage was financed at an interest rate of 4.30%, compounded semi-annually, over 25 years.

a) Determine Kaia's monthly mortgage payment.
b) Kaia's house appreciates in value at an average rate of 2.00% per year. What will the value of her house be after 15 years?
c) How much equity will Kaia have in the house after 15 years?

34. Dimitri owns a house with a mortgage of $175,000.00. He has $165,000.00 in other loans and his net worth is $300,000.00.

a) Determine his debt-to-equity ratio.
b) Determine his total assets.
c) Dimitri wants to borrow $10,000.00 to take his family on a vacation. Using his debt-to-equity ratio in (a), explain if the bank will lend him the money.

JUNE 2019

35. A dealership has 6 cars, 2 vans, and 4 trucks for sale.

a) [Probability]. An employee is asked to park all of these vehicles in a row. How many different ways can this be done if all of the cars must be together, all of the vans must be together, and all of the trucks must be together?

b) Diane visits the dealership and decides to buy one of the trucks. The price of this truck is $36,500.00, taxes included. She has $4,000.00 for a down payment. The balance will be financed at an interest rate of 2.99%, compounded monthly, for 7 years. Calculate her monthly payment.

c) What is the total amount Diane will pay to buy the truck?

36. Renasha deposits $1,200.00 into a savings account that earns simple interest at a rate of 1.72% annually. What is the total value of Renasha's account at the end of one year?

A) $20.64 B) $1,220.64 C) $1,447.68 D) $3,264.00

37. Mr. Chen is moving to Manitoba and is looking for a place to live. State two reasons why Mr. Chen would prefer renting a house instead of buying a similar house.

Reason 1:

Reason 2:

38. Nadia hopes to save enough money over a 6-year period to go on a trip estimated to cost $11,600.00. To start saving, she deposits $1,250.00 into an account that earns an interest rate of 4.21%, compounded monthly.

a) If she makes monthly payments of $110.00 into this account, how much money will she have at the end of the 6-year period?
b) What is the minimum number of additional monthly payments Nadia needs to make in order to save enough money for the trip?

39. Marshall and Kim are renting a house that they hope to purchase. They pay $1,800 in annual heating costs and know that the annual property taxes are $2,500. Their combined gross income is $5,200 per month.

a) Based on the gross debt service ratio (GDSR), what is the maximum monthly mortgage payment they can afford?

b) If they have saved $30,000.00 for a down payment, what is the maximum house price they can afford based on a 25-year amortization period at an interest rate of 4.64%, compounded semi-annually?

40. Amor and Angélique each want to retire at age 65. They start investing in tax-free savings accounts (TFSA) at different ages in their lives.

- At age 28, Amor starts investing $240.00 per month into a TFSA that earns an interest rate of 2.95%, compounded monthly.

- At age 42, Angélique makes an initial deposit of $5,000.00 and starts investing $350.00 per month into a TFSA that earns an interest rate of 3.50%, compounded monthly.

a) What is the value of each of their TFSAs at age 65?
b) Explain why a small long-term investment may be worth more than a large short-term investment.

ANSWERS TO
UNIT B – PERSONAL FINANCE
PREVIOUS EXAM QUESTIONS

These are just the answers. The full detailed solutions are in the marking guides available at

Assessment and Evaluation
Archived Tests and General Comments

https://www.edu.gov.mb.ca/k12/assess/archives/#applied

Also there are exemplar examples of common mistakes to anticipate.

JAN 2016

1. advantage of buying a house: d) no restrictions on renovations

2. 20 years

3. a. His overall rate of return is 4.17%.
b. Variety of possible answers:
   - Bruce's portfolio is very conservative. Assuming that he is a low risk-taker, this portfolio is appropriate for him.
   - Assuming Bruce may want to buy a house in the near future, he should consider more liquid investments.
   - The rate of return is low over a 4-year period. Bruce should consider some higher yield investments such as stocks since he is young and has many years until retirement.

4. It will take Pedro 34.06 months to save $20 000.00

5. a. The department store will bill her $1350.32 one year after the date of purchase
b. multiple answers:
Any compounding period longer than monthly, for example
• semi-annually
• annually

6. a. Their monthly payment is $1823.12
b. They will owe $322 054.57 after 5 years
c. They will pay off their mortgage 10.32 months sooner

JUN 2016

7. **B.** $13 300
8. **C.** semi-annually

9. a. 29.69%

b. Yes, the bank will likely offer them a mortgage since the GDSR is below 32%.

10. multiple responses possible:
lower monthly payment • can change vehicle at the end of the lease period • do not have to worry about selling the vehicle

11. a. Her payment will be $460.45
b. The cabin will be valued at $221 746.20
c. She will have $166 815.40 in equity after 10 years

12. a. Alfred will have $288 905.49 at retirement
b. He can make withdrawals for 221 months
c. Marianne can withdraw a maximum of $1169.18 each month

JAN 2017

13. **C.** 12 years
14. Option 1: $35,189.11; Option 2: $36,474.14. Option 2 allows Imani to purchase a more expensive car

15. Multiple possible answers

16. a. Her investment will be worth $401,806.02 at retirement
b. She will be 82 years old when the account balance is zero

17. a. The maximum amount is $188,851.29
b. The maximum amount is $272,540.68
c. Multiple possible answers. The Bashir family would choose to buy the less expensive house since they would own their house sooner

18. a. The value for Plan A is $13,285.11 while it is $18,193.97 for Plan B
b. PLAN A: $3,285.11 PLAN B: $8,193.97

19. a. Their monthly mortgage payment will be $1,129.25
b. They will have paid $110,755.00

JAN 2018

20. a. The computer system will be worth $3,684.75

21. a. The total cost will be $395,845.00
b. It will take Pedro 26.39 years
c. suggested possible answers:
- He will own the house after 25 years.
- He could sell the house.
- He will build home equity
- Etc.

22. a. Donald and Alex can afford a maximum monthly mortgage payment of $1235.00
b. They can afford a house with a price of $267,360.98

JUN 2018

23. D) 28%

24. a. Johannes' net worth is $74,000.00
b. His debt-to-equity ratio is 33.78%
c. The bank would lend him money since his debt-to-equity ratio is less than 50%

26. It takes 9 years for the money to double in value
The initial amount Rémi deposited is approximately $800.00.

27. The donation must be invested at an interest rate of 6.15%.

28. a. The maximum amount of money the bank will lend Bonnie and Clyde for their mortgage is $235,163.06
b. The maximum house price they can afford is $265,163.06.

29. a. Option 1: 25 years Option 2: 21.97 years
b. $378,000.50 – $359,934.59 = $18 065.91. He will save $18 065.91

JAN 2019

30. B) semi-annually
31. Multiple Possible answers :
• She could be penalized for exceeding the limit of kilometres driven. • The vehicle cannot be customized. • There is no potential for equity. • Her job might change and her driving requirements may also change.

32. a. The value of Investment 1 will be $145,025.69. The value of Investment 2 will be $338,449.99
b. $145,025.69 + $338,449.99 = $483 475.68. No, he will not meet his goal.

33. a. Kaia's monthly mortgage payment is $1,627.23
b. The value of her house will be $538,347.34
c. Kaia will have $379,585.55 in equity after 15 years

34. a. His debt-to-equity ratio is 55%
b. His total assets are $640,000.00.
c. No, the bank will not lend him the money since his debt-to-equity ratio is above 50%

JUN 2019

35. a. There are 207,360 different ways
b. Her monthly payment is $429.29
c. The total amount Diane will pay is $40,060.36

36. B) $1,220.64

37. Possible answers: No down payment is needed. Mr. Chen would not be responsible for maintenance. If Mr. Chen needed to relocate, he would not need to sell the house.

38. a. She will have $10,600.78 at the end of the 6-year period
b. Nadia needs to make a minimum of 7 additional monthly payments

39. a. The maximum monthly mortgage payment they can afford is $1305.67
b. The maximum house price they can afford is $262,622.61

40. a. The value of Amor's TFSA is $192 789.31 while Angélique's is $159,259.67
b. A small long-term investment may earn more interest compared to a large short-term investment.

There are tons more practice problems available for prior years and from other sources. Find them yourself, or ask teacher.