

## Personal Loans, Lines of Credit and Overdrafts



*Denise says that math skills are key to the performance of her duties at work.*

### MATH ON THE JOB

Denise Morine works at Valley Credit Union. The credit union has 8 branches in Nova Scotia's Annapolis Valley. At work, Denise is responsible for producing financial statements, branch profit reports, and other reports used by management.

Denise also produces monthly and annual budgets for Valley Credit Union. The calculations she completes for the budgets include interest calculations. "I do interest calculations for numerous items when it comes to our annual budgeting process. I have calculations in the monthly budget for customer-owner loans, lines of credit, mortgages and overdrafts," says Denise.

Though computer programs help her with the mathematical aspect of her job, Denise says that it is important to be able to understand and do the calculations without technology. "Even with extensive use of computers, you still need to have math skills to understand how to use the software properly," she says.

Assume that a budget Denise produces includes calculations for a loan of \$12 000.00. The term for the loan is 4 years and the monthly payments are \$277.20. How much interest will be paid on the loan over 4 years?

### SOLUTION

Multiply the number of months by the monthly payment.

$$(4 \times 12) \times \$277.20 = \$13\,330.08$$

The payment will be \$13 330.08.

Calculate how much was paid in interest.

$$\$13\,330.08 - \$12\,000.00 = \$1\,330.08$$

\$1330.08 was paid in interest.

$$277.20 \times 12 \times 4 = 13\,305.60$$

$$13\,305.60 - 12\,000 = \$1\,305.60$$

## So You Wanna Borrow Some Money...BANK!!!

**loan** money that is borrowed for a specific term, to be paid back with interest

**amortization period** the time required to pay back a loan

- interest is calculated from the start date to the end date

**line of credit** an approved loan amount that you can draw on as needed, with interest charged on the money used

- has a credit limit.

**overdraft protection** an agreement with a bank that allows you to withdraw more money from an account than you have in it, up to a specified amount

- if you go over the overdraft, the bank will charge a non-sufficient funds fee (\$20 - \$50).

\*\*\* Many times the interest rate is based upon the Bank of Canada's "**Prime**" rate, which changes periodically.

## So You Want Some Quick Cash...Payday Loan???

**payday loan:** a small, short-term loan with a high interest rate intended to cover the borrower's expenses until their next pay day  
- interest is calculated **daily**.

### Example 1

A payday loan store charged Matt \$40.00 interest on a \$350.00 loan. Matt paid back the total amount of \$390.00 after 10 days.

- What was the daily interest rate for this loan?
- What was the annual interest rate for this loan?

Calculate part b) first, then calculate part a).

- Calculate the annual interest rate first using the simple interest formula, where  $t$  is given in years.

$$I = Prt$$

$$\$40.00 = \$350.00 \times r \times (10 \div 365)$$

$$\$40.00 = 9.58904r$$

$$\$40.00 \div 9.58904 = r$$

$$4.17101 \approx r$$

Convert the interest rate from a decimal to a percent.

$$r = 4.17101 \times 100$$

$$r \approx 417.1$$

The annual interest rate is 417.1%.

- Calculate the daily interest rate by dividing the annual interest rate by 365.

$$r = 417.1 \div 365$$

$$r = 1.14$$

The daily interest rate is 1.14%.

$$\begin{array}{l}
 \text{b) } r = \frac{I}{Pt} \\
 = \frac{40}{350(10/365)} \\
 = 4.17 \\
 = 417\%
 \end{array}
 \qquad
 \begin{array}{l}
 \text{a) } \frac{417}{365} \\
 = 1.14\%
 \end{array}$$

**DISCUSS THE IDEAS****PERSONAL LOANS**

A loan can be **secured or unsecured**. A secured loan means that the borrower has promised to turn over to the lender a particular item of value, such as a car or property, if they **default**, or fail to repay, the principal and interest on the loan. The item of value is **collateral**. An unsecured loan is a loan for which the lender considers you a low risk, so there is no need for collateral.

The interest rate on secured loans is usually lower than the interest rate on unsecured loans.

1. Suggest reasons why the interest rate would be lower on a secured loan.
2. Do you think the amount of money a financial institution would lend someone would change depending on what was being used to secure it? Why or why not?
3. What **assets** might people generally use as collateral to secure a loan?

**default**: failure to repay a loan

**collateral**: an item of value pledged by a borrower to secure a loan

**asset**: an item of economic value owned by an individual that could be converted to cash

**SOLUTION**

1. The interest rate on a secured loan is usually lower than the interest rate on an unsecured loan because, if you default on the loan, the lender will be compensated by claiming the collateral.
2. A financial institution will usually lend money based on the value of the collateral. If the collateral is a car, the value of the loan will be lower than if the collateral were a house. This is because the lender wants to be able to get back the value of the money they lent out if you default on the loan.
3. Some assets used as collateral include: vehicles, real estate, cash bank accounts, investments, insurance policies, and valuables such as jewellery.

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER \$1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)					
Interest rate (%)	Term in years				
	1	2	3	4	5
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
3.50	84.92	43.20	29.30	22.36	18.19
3.75	85.04	43.31	29.41	22.47	18.30
4.00	85.15	43.42	29.52	22.58	18.42
4.25	85.26	43.54	29.64	22.69	18.53
4.50	85.38	43.65	29.75	22.80	18.64
4.75	85.49	43.76	29.86	22.92	18.76
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80
7.25	86.64	44.89	30.99	24.06	19.92
7.50	86.76	45.00	31.11	24.18	20.04
7.75	86.87	45.11	31.22	24.29	20.16
8.00	86.99	45.23	31.34	24.41	20.28
8.25	87.10	45.34	31.45	24.53	20.40
8.50	87.22	45.46	31.57	24.65	20.52
8.75	87.34	45.57	31.68	24.77	20.64
9.00	87.45	45.68	31.80	24.89	20.76
9.25	87.57	45.80	31.92	25.00	20.88
9.50	87.68	45.91	32.03	25.12	21.00
9.75	87.80	46.03	32.15	25.24	21.12
10.00	87.92	46.14	32.27	25.36	21.25
10.25	88.03	46.26	32.38	25.48	21.37
10.50	88.15	46.38	32.50	25.60	21.49
10.75	88.27	46.49	32.62	25.72	21.62
11.00	88.38	46.61	32.74	25.85	21.74

## LOANS: Monthly Payments...

### Example 2

Jean-Paul borrows \$2500.00 to purchase a laptop computer and software. He takes out a personal loan from his credit union at an annual rate of 6.25% with an amortization period of 2 years. Use the personal loan payment calculator table on the next page to help you answer the questions below.

- What is Jean-Paul's monthly payment?
- Calculate the total amount he will pay over the 2 years.
- Calculate the finance charge on the loan.

$$a) \quad \$44.43 \times \frac{2500}{1000} = \$111.08$$

$$b) \quad 111.08 \times 12 \times 2 = 2665.92$$

$$c) \quad 2665.92 - 2500 = \$165.92$$

### SOLUTION

- Using the personal loan payment calculator table, first look up the interest rate of 6.25% in the left-hand column, then move across that row to the column showing the monthly payments for 2 years. The payment is \$44.43 a month for a loan of \$1000.00.

To calculate the monthly payment for a loan of \$2500.00, divide the amount of the loan by \$1000.00, then multiply by \$44.43.

$$\$2500.00 \div \$1000.00 \times \$44.43 \approx \$111.08$$

Jean-Paul's monthly payment is approximately \$111.08.

- He will pay \$111.08 a month for 2 years, or 24 months.

$$\$111.08 \times 24 \text{ months} = \$2665.92$$

Jean-Paul will pay a total of \$2665.92 over the 2 years.

- The finance charge is the difference between the amount borrowed and the total amount to be repaid.

$$\$2665.92 - \$2500.00 = \$165.92$$

The finance charge on the loan will be \$165.92.

**ACTIVITY 3.10**  
**COMPARING TYPES OF LOANS**

Banks sometimes offer overdraft protection, allowing you to withdraw more money from your bank account than you have available. Banks differ in the way they charge for this service. One way is that if you write a cheque or use your bank card, the bank will still pay the amount due, but you will be charged a fee for each overdraft transaction.

Many financial institutions do not allow overdrafts, particularly with accounts that have low monthly fees. If you write a cheque, it could be returned NSF (Non-Sufficient Funds). When this happens, your bank will charge you a fee (usually between \$20.00 and \$50.00) for the NSF item.

If you need money, you can borrow funds in a variety of ways. It is best to research your options, because different loans have different interest rates.

1. Craig uses cheques to pay his bills. One day, he uses his bank card to splurge on a new guitar, forgetting that a cheque for \$100.00 and another for \$125.00 had not yet cleared from his account. Craig also forgets that the Bank of Atlantic Canada charges him \$35.00 for each NSF cheque returned. How much in total does Craig have to pay in NSF fees?
2. Imagine Craig runs out of money before his next payday and needs to borrow \$225.00 to cover his cable and internet bills. He takes out a payday loan. After 10 days, he pays back the principal plus interest for a total of \$261.00. What is the daily interest rate on the loan?
3. Imagine Craig has overdraft protection of \$500.00 on his chequing account. His bank charges him 0.08% a day simple interest on the overdraft amount plus a \$5.00 overdraft fee. If he wrote the two cheques, one for \$125.00 and the other for \$100.00, how much would he pay in overdraft charges for these cheques if it took him 10 days to pay off his overdraft?
4. Imagine Craig has a line of credit for \$1000.00 with an interest rate of 4.00% per annum. He has a negative balance of \$225.00 for 10 days. How much interest will he have to pay?
5. Given Craig's experiences, what do you think would be the best way for someone to cover a financial shortfall? What are your reasons?
6. What would be the advantage of negotiating a lower interest rate when applying for a line of credit?

**SOLUTIONS**

1. Calculate Craig's NSF charges.  
 $\$35.00 \times 2 = \$70.00$   
 Craig will be charged \$70.00 in NSF fees.
2. Calculate how much interest Craig would pay.

$$\$261.00 - \$225.00 = \$36.00$$

Calculate the interest rate.

$$I = Prt$$

$$\$36.00 = \$225.00 \times r \times 10$$

$$36 = 2250r$$

$$36 \div 2250 = r$$

$$0.016 = r$$

Convert the interest rate to a percent.

$$0.016 \times 100 = 1.6$$

The daily interest rate is 1.6%.

3. Calculate the interest charged on the overdraft.

$$I = Prt$$

$$I = \$225.00 \times 0.0008 \times 10$$

$$I = \$1.80$$

Craig would be charged \$1.80 plus the overdraft fee.

$$\$1.80 + \$5.00 = \$6.80$$

Craig would pay \$6.80 for the overdraft.

4. Calculate the interest charged on the line of credit.

$$I = Prt$$

$$I = \$225.00 \times 0.04 \times (10 + 365)$$

$$I = \$0.25$$

Craig would have to pay \$0.25 interest.

5. The best way to cover a financial shortfall is to borrow money on a line of credit. A line of credit usually has a much lower interest rate than overdraft protection or a payday loan.
6. When applying for a line of credit, it is best to negotiate for the lowest possible interest rate. Because interest is charged starting on the day of the withdrawal, a lower interest rate will save you money.

*Words of wisdom...  
something to remember!!!*

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- Never pay off credit card debts by only paying minimum payments.
  - Always pay off the balance of your credit card each month to avoid interest.
    - Be careful to check special offers because they could cost you more money.
      - Decide whether you can wait to purchase an item in order to avoid borrowing.
        - Never take out a payday loan.

## **HOMEWORK...**

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**3.4 Build your Skills Detailed Solutions.pdf**





## REFLECT ON YOUR LEARNING **Ready for the test???**

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### FINANCIAL SERVICES

Now that you have finished this chapter you should be able to:

- describe banking options and discuss their advantages and disadvantages;
  - solve simple interest problems;
  - solve compound interest problems;
  - use the Rule of 72 to estimate the time needed for an investment to double;
  - describe different credit options, including bank and store credit cards, personal loans, lines of credit, and overdrafts;
  - solve problems that involve credit cards;
  - solve problems that involve loans;
  - solve problems that involve sales promotions; and
  - make informed decisions related to the use of credit.
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## Review Questions...

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**Chapter 3 Financial Services Practice Your New Skills Solutions.pdf**



- **Chapter 3 Sample Test.pdf**



## Attachments

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Chapter 3 Sample Test.pdf

3.4 Build your Skills Detailed Solutions.pdf

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