

2.3 Solving Problems Involving Credit p. 104

Name _____

Date _____

Goal: Solve problems that involve credit.

1. **line of credit:** A pre-approved loan that offers immediate access to funds, upto a pre-defined limit, with a minimum monthly payment based on accumulated interest; a **secure line of credit** has a lower interest rate because it is guaranteed against the client's assets, usually property.
2. **Bank of Canada prime rate:** A value set by Canada's central bank, which other financial institutions use to set their interest rates.

INVESTIGATE the Math

Liam wants to buy a carving by Inuvialuit artist Eli Nasogaluak. He thinks it will cost \$3900 and is considering these two credit options:

- A **line of credit**, which has a limit of \$10 000 and an interest rate of 2%, compounded daily, above the **Bank of Canada prime rate** (which is currently 0.5%), to be repaid in 16 monthly payments
- A bank loan at 4%, compounded monthly, to be repaid in one payment at the end of the term
-

Liam chose the bank loan when he found out that the interest amount would be the same as he would pay if he used the line of credit.

What is the term for Liam's bank loan?

LOC**Bank Loan**

N =

N =

I% =

i% =

PV =

PV =

PMT =

PMT =

FV =

FV =

P/Y =

P/Y =

C/Y =

C/Y =

- A. How much interest would Liam pay if he used the line of credit?
- B. Predict whether the term for Liam's bank loan will be more or less than 16 months. Explain.
- C. What term for the bank loan will accumulate the same amount of interest as the line of credit?
- D. Why do you think Liam chose the bank loan over the line of credit?

Example 1: Solving a Credit Problem that Involves overall cost and number of payments
(p.105)

Meryl and Kyle are buying furniture worth \$1075 on credit. They can make monthly payments of \$75 and have two credit options. Which option should they choose? Explain.

Option A: The furniture store credit card, which is offering a \$100 rebate off the purchase price and an interest rate of 18.7%, compounded daily

Option B: A new bank credit card, which has an interest rate of 15.4%, compounded daily, but no interest for the first year

Option A

Option B

N =

N =

I% =

i% =

PV =

PV =

PMT =

PMT =

FV =

FV =

P/Y =

P/Y =

C/Y =

C/Y =

Example 2: Solving a credit problem that involves payment amount and overall cost (p.106)

Ed wants to buy a car and needs to use credit to finance it. The cost, with taxes and shipping, is \$24 738. Ed wants to repay his loan in 4 years using monthly payments and has two credit options:

- His secured line of credit at 1.7%, compounded monthly, above the Bank of Canada rate, which is currently 0.5%
- The dealership's financing plan at 2.5%, compounded daily

a) Which option should he choose? Why?

LOC

Dealership Financing

N =

N =

I% =

i% =

PV =

PV =

PMT =

PMT =

FV =

FV =

P/Y =

P/Y =

C/Y =

C/Y =

b) Suppose that the Bank of Canada rate changed to 1.1% after 2 years. How would this affect his line of credit payments if he still wanted to pay off the loan in 4 years?

Years 1 & 2

Years 3 & 4

N =

N =

I% =

i% =

PV =

PV =

PMT =

PMT =

FV =

FV =

P/Y =

P/Y =

C/Y =

C/Y =

c) If the Bank of Canada rate changed as described in part b), does your answer to part a) change? Explain.

Example 3: Solving a problem that involves interest amount and rate (p. 109)

Jon's \$475 car insurance payment is due. He does not have enough cash to make the payment, so he is considering these two credit options:

- Borrow the money from a payday loan company for a \$100 fee if it is paid back in full within 2 months.
 - Get a cash advance on his credit card, which is carrying a zero balance. The interest charged for cash advances is 19.99%, compounded daily, and takes effect immediately. He can afford to pay the required \$5 minimum payment after the first month and then plans to pay off the balance in full at the end of the second month.
- a) Which is the better option for Jon? Explain.
 - b) What annual interest rate would equate to the fee charged by the payday loan company?

Example 4: Solving a debt consolidation problem that involves an interest amount (p.110)

Nicki wants to be debt-free in 5 years. She has two credit cards on which she makes monthly payments:

- Card A has a balance of \$2436.98 and an interest rate of 18.5%, compounded daily.
- Card B has a balance of \$3043.26 and an interest rate of 19%, compounded daily.

Nicki has qualified for a line of credit at her bank with an interest rate of 9.6%, compounded monthly, and a credit limit of \$6000. She plans to pay off both credit card balances by borrowing the money from her line of credit. How much interest will she save?

Consolidated	Card A	Card B
N =	N =	N =
I% =	I% =	I% =
PV =	PV =	PV =
PMT =	PMT =	PMT =
FV =	FV =	FV =
P/Y =	P/Y =	P/Y =
C/Y =	C/Y =	C/Y =

Example 6: Solving for totals with credit promotions (p. 113)

Freda signed up for a special credit offer when she bought her living-room furniture. There were no payments and no interest for 12 months, as long as she paid the balance of \$2643.65 in full by the end of the first year. Otherwise, a penalty equal to an interest rate of 19.95%, compounded monthly, on the full balance would be charged, starting from when she first borrowed the money.

- a) If Freda missed the deadline by one day, what would she have to pay? What would the penalty be?
- b) Suppose that she made monthly payments of \$150 during the first year. What would her 12th and last payment need to be to avoid an interest penalty?

Example 5: Solving for the term when making minimum payments (p. 112)

Bree had a balance of \$1004.36 on her credit card when she lost her job. The interest rate for the credit card is 19.95%, compounded monthly. Bree can only afford to pay the minimum payment each month, which is 3% of the balance or \$15, whichever is greater.

- a) How long will it take Bree to pay off her credit card?
- b) How much will she pay back altogether? How much of this amount will be interest?

*****CAN ONLY BE SOLVED WITH A SPREADSHEET*****

In Summary

Key Ideas

- Forms of credit that can be used to make purchases or acquire cash include bank loans, lines of credit, credit cards, payday loans, and dealership or in-store financing.
- There are many factors that determine the best credit option, such as the interest charged, the total payment, the amount of each payment, and the length of time it takes to pay off the loan. All of these factors must be considered carefully before making a decision.

Need to Know

- Credit cards have a credit limit, which is the maximum amount you can borrow. The credit limit varies from person to person, based on credit history.
- Cash advances on credit cards have no period in which no interest is charged and sometimes have a greater interest rate than purchases.
- A line of credit has a lower interest rate than most loans and credit cards. Because of this, a line of credit can be useful for consolidating debt.
- As with a credit card, a line of credit allows for flexibility in how the loan is paid back, as long as the minimum payment is made. The minimum payment is often based on the accumulated interest each month.
- Credit that is offered in conjunction with a special offer or promotion must be considered very carefully. There may be conditions for how the loan is paid back, which may result in unexpected costs or penalties.
- Payday loans must also be considered carefully, since the fee for borrowing is often high.
- An amortization table is particularly useful when you need to know interim values and when payment amounts or interest rates vary throughout the term of a loan.

HW: 2.3 p. 114-118 #4, 7, 9, 11 & 15