

2.3

Solving Problems Involving Credit

YOU WILL NEED

- calculator
- financial application
- spreadsheet software

EXPLORE...

Suppose that you want to make a purchase of \$2000 and you can afford monthly payments of \$120. At what interest rate (x) is the store credit card below a better choice than the bank credit card? Assume that the same number of payments is made for both credit cards.

- a bank credit card at 15% interest, compounded daily
- a store credit card at $x\%$ interest, compounded daily, with a \$100 rebate on the purchase

line of credit

A pre-approved loan that offers immediate access to funds, up to 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.

Bank of Canada prime rate

A value set by Canada's central bank, which other financial institutions use to set their interest rates.

GOAL

Solve problems that involve credit.

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?

- How much interest would Liam pay if he used the line of credit?
- Predict whether the term for Liam's bank loan will be more or less than 16 months. Explain.
- What term for the bank loan will accumulate the same amount of interest as the line of credit?

Reflecting

- Why do you think Liam chose the bank loan over the line of credit?
- Why might he choose the line of credit instead?



Eli Nasogaluak took this photograph of his sculpture of a polar bear.

APPLY the Math

EXAMPLE 1

Solving a credit problem that involves overall cost and number of payments

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



Noah's Solution

Option A:

Store credit card, \$100 rebate and 18.7% compounded daily

The present value is \$975.

The payment amount is \$75.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is unknown.

The annual interest rate is 18.7%.

The compounding frequency is 365 times per year.

The future value is \$0.

The number of monthly payments is

14.654..., which is 15.

The total interest paid is 124.200... or \$124.20.

The total paid is $\$975 + \$124.200...$ or \$1099.20.

Option B:

New credit card, no interest for the first year, then 15.4% compounded daily

First year:

12 payments of \$75 per month or \$900.

For each credit option, I determined the total payments and how long it would take to pay off the total amount. I knew that comparing the interest charged would not be helpful since one option involves a rebate.

I used the financial application on my graphing calculator to solve for the number of payments.

I used the sum of interest financial application to determine the total interest paid over the total number of payment periods.



Second year:

The present value is $1075 - 900 = \$175$.

The payment amount is \$75.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is unknown.

The annual interest rate is 15.4%.

The compounding frequency is 365 times per year.

The future value is \$0.

The number of monthly payments in the second year is 2.384..., which is 3, so the total number of monthly payments is $12 + 3 = 15$.

The total interest paid is 3.949... or \$3.95.

The total paid is $\$1075 + \$3.949...$ or \$1078.95.

They should use the bank credit card because it has the lower overall cost.

I used the financial application on my graphing calculator to solve for the number of payments.

I used the sum of interest financial application to determine the total interest paid over the total number of payment periods.

For the new bank credit card, the principal was reduced by \$900 before any interest was charged. That's why the total interest paid is so low, despite a high interest rate.

Your Turn

What rebate could the store offer with its credit card to make it the more attractive option?

EXAMPLE 2

Solving a credit problem that involves payment amount and overall cost

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



- Which option should he choose? Why?
- 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?
- If the Bank of Canada rate changed as described in part b), does your answer to part a) change? Explain.

Alex's Solution

- a) Line of credit:

The present value is \$24 738.

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is $4 \cdot 12$ or 48.

The annual interest rate is $0.5\% + 1.7\%$ or 2.2% .

The compounding frequency is 12 times per year.

The future value is \$0.

The payments will be 538.856... or \$538.86.

Dealership financing:

The present value is \$24 738.

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is 48.

The annual interest rate is 2.5% .

The compounding frequency is 365 times per year.

The future value is \$0.

The payments will be 542.136... or \$542.14.

Ed should use his line of credit, since the total payments will be less.

I knew that the option with the lower payment amount will be better, since the number of payments is the same.

I used the financial application on my calculator to solve for the payment amount.

I used the financial application on my calculator to solve for the payment amount.

48 payments of \$538.86 is better than 48 payments of \$542.14.



b) Years 1 and 2 at 2.2%:

The present value is \$24 738.

The payment amount is \$538.86.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is 24.

The annual interest rate is 2.2%.

The compounding frequency is 12 times per year.

The future value (after 2 years) is unknown.

The future value is \$12 640.727....

Since the interest rate increased for the last 2 years, I knew that the payments in years 3 and 4 would have to be greater for the loan to be paid off in the same amount of time.

I determined the future value of the loan after 2 years at 2.2%.

Years 3 and 4 at 2.8%:

The present value is \$12 640.727....

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is 24.

The annual interest rate is 1.1% + 1.7% or 2.8%.

The compounding frequency is 12 times per year.

The future value is \$0.

The regular payment is \$542.196... or \$542.20.

I used this future value as the present value of the loan for years 3 and 4.

I solved for the payment amount that will result in a future value of \$0 at 2.8%.

c) Total payments for Ed's line of credit:

$(538.86)(24) + (542.20)(24)$ or \$25 945.44

Total payments for dealership financing:

$48(542.14)$ or \$26 022.72

If the Bank of Canada rate rises to 1.1%, the line of credit is still the better option.

I determined the total payment amount for both options.

The lower payments in the first 2 years made up for the higher payments in the last 2 years.

Your Turn

Suppose that the interest rate for the line of credit decreased over the 4 years, from 2.8% for the first 2 years to 2.2% for the last 2 years. Would the total payments be the same? Explain.

EXAMPLE 3

Solving a problem that involves interest amount and rate

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.

- Which is the better option for Jon? Explain.
- What annual interest rate would equate to the fee charged by the payday loan company?

Leah's Solution

- a) Cost of payday loan: \$100 for 2 months

Month 1:

$$A = P(1 + i)^n$$

$$A = 475 \left(1 + \frac{0.1999}{365} \right)^{\frac{365}{12}}$$

$$A = 482.976\dots$$

Month 2:

$$A = (482.976\dots - 5) \left(1 + \frac{0.1999}{365} \right)^{\frac{365}{12}}$$

$$A = 486.003\dots$$

$$486.003\dots - 475 \text{ or } 11.003\dots$$

Cost of credit card cash advance: \$11.00 for 2 months

The cash advance is better because the cost is considerably less and has the added benefit of flexible payments.

- b) $A = P(1 + i)^n$

$$575 = 475(1 + i)^2$$

$$1.210\dots = (1 + i)^2$$

$$\sqrt{1.210\dots} = \sqrt{(1 + i)^2}$$

$$1.100\dots = 1 + i$$

$$0.100\dots = i$$

$$(0.100\dots)(12) \text{ or } 1.2028\dots$$

A fee of \$100 on \$475 for 2 months is equivalent to an annual interest rate of 120.28%.

The cost of the payday loan for 2 months is the \$100 fee.

The cost of the cash advance is the interest charged over 2 months. To determine this, I used the compound interest formula to determine the future value of \$475 at 19.99%, compounded daily, after the first month.

I reduced the future value by the \$5 payment. Then I used this amount as the present value in the compound interest formula to determine the future value after the second month.

If Jon had the cash, he could pay off his credit card balance in full at the end of the first month. Then he would pay even less interest.

I used the compound interest formula to determine the monthly interest rate for a future value of \$575, a principal of \$475, and 2 monthly compounding periods.

I multiplied by 12 to determine the annual rate.



Your Turn

- Why do you think people use payday loans when the cost of borrowing is so high?
- Why do you think the cost of Jon's payday loan was expressed as a fee instead of an interest rate?

EXAMPLE 4

Solving a debt consolidation problem that involves an interest amount

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?



Chloe's Solution

Interest paid if debt is consolidated:

The present value is $2436.98 + 3043.26$
or \$5480.24

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is $5 \cdot 12$ or 60.

The annual interest rate is 9.6%.

The compounding frequency is 12 times per year.

The future value is \$0.

The payment amount is 115.363....

The total interest paid is 1441.554... or
\$1441.55.

To determine how much interest Nicki would save, I needed to compare the interest she would pay if she consolidated her debt with the interest she would pay if she did not consolidate her debt.

I used the financial application on my calculator and entered these values to determine the payment amount for the consolidated debt in the line of credit.

I used the sum of interest financial application to determine the total interest paid over 60 payment periods (5 years).



Interest paid for card A if debt is not consolidated:

The present value is \$2436.98.

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is 60.

The annual interest rate is 18.5%.

The compounding frequency is 365 times per year.

The future value is \$0.

The payment amount is 62.732....

The total interest is 1326.997....

I entered these values into my financial application to solve for the payment amount for each debt.

I used the sum of interest financial application to determine the total interest paid over 60 payment periods.

Interest paid for card B if debt is not consolidated:

The present value is \$3043.26.

The payment amount is unknown.

The payment frequency is 12 times per year.

The payments are made at the end of the payment periods.

The number of payments is 60.

The annual interest rate is 19%.

The compounding frequency is 365 times per year.

The future value is \$0.

The payment amount is 79.188....

The total interest is 1708.070....

I combined the interest for both credit card debts.

$$1326.997... + 1708.070... = 3035.067...$$

Nicki would have paid \$3035.07 in interest.

Consolidating her debt will save Nicki

$$3035.07 - 1441.55 \text{ or } \$1593.52.$$

I subtracted the interest that Nicki would pay if she consolidated her debt from what she would pay if she did not consolidate her debt.

Your Turn

When both her credit cards have a zero balance, Nicki will start using them again. However, she intends to use her line of credit to pay off the balance on her credit cards every month if she does not have the available cash.

- Why might this be a good strategy for managing debt?
- What does she have to watch out for?

EXAMPLE 5**Solving for the term when making minimum payments**

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.

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

T.J.'s Solution**Bree's Amortization Table**

	A	B	C	D	E
1	Payment (months)	Payment Amount (\$)	Interest Paid (\$)	Principal Paid (\$)	Outstanding Balance (\$)
2	0				1004.36
3	1	30.1308	16.69749	13.43332	990.927
4	2	29.7278	16.47416	13.25364	977.673
5	3	29.33019	16.25381	13.07638	964.597
54	52	15.16242	8.402509	6.759913	498.654
55	53	15	8.290125	6.709875	491.944
56	54	15	8.178573	6.821427	485.123
99	97	15	1.139178	13.86082	54.6612
100	98	15	0.908742	14.09126	40.5699
101	99	15	0.674475	14.32553	26.2444
102	100	15	0.436313	14.56369	11.6807
103	101	11.8749	0.194192	11.68071	0
104		1866.168	861.8084	1004.36	

I used an amortization table to show the different payment amounts each month: 3% of the balance until the payment reached \$15 and then a final payment, which would be less than \$15. I used a spreadsheet because of the number of calculations involved.

I entered a formula in the Payment Amount column to determine 3% of the previous month's balance.

When the payment amount dropped below \$15, I adjusted it to \$15.

Then, when the outstanding balance dropped below \$15, the spreadsheet calculated the final payment amount.

The final payment amount was the last balance, plus interest for the month.

- It will take Bree 101 months, or 8 years 5 months, to pay off the credit card.
- Bree will pay \$1866.17 altogether in payments. Of this amount, \$861.81 will be interest.

I noticed that the total amount she pays is almost twice what she owed in the first place.

Your Turn

Suppose that Bree got a new job 3 months after she lost her old job, so she could afford to pay \$100 per month on her credit card balance. How much sooner would she pay off the balance? How much less interest would she pay?

EXAMPLE 6**Solving for totals with credit promotions**

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?

Dawna's Solution

a) $A = P(1 + i)^n$

$$P = 2643.65$$

$$i = \frac{0.1995}{12}$$

$$n = 13$$

$$A = 2643.65 \left(1 + \frac{0.1995}{12} \right)^{13}$$

$$A = 3275.624\dots \text{ or } \$3275.62$$

Freda would have to pay \$3275.62.

The interest penalty would be $3275.62 - 2643.65$ or \$631.97.

- b) Let p represent the 12th payment:

$$(11)(150) + p = 2643.65$$

$$p = 2643.65 - 1650$$

$$p = 993.65$$

Freda would need to make a 12th payment of \$993.65 to avoid interest charges.

Since the compounding was monthly, I knew that she would have to pay interest for 13 months, instead of 12 months 1 day.

The interest penalty would be almost 25% of the original cost of the furniture.

I wrote an equation I could use to determine the 12th payment.

Your Turn

Why is it important to read the terms and conditions of credit offers carefully?

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

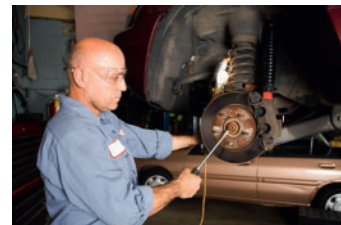
- Credit cards have a credit limit, which is the maximum amount you can borrow. The credit limit varies from person to person, based on credit history.
- Cash advances on credit cards have no period in which no interest is charged and sometimes have a greater interest rate than purchases.
- A line of 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.

CHECK Your Understanding

1. Rilla bought a new chair for \$526.83. She paid for the chair with her credit card at 19.7%, compounded daily.
 - a) If Rilla repays the loan in 1 year, how much will her payments be?
 - b) When Rilla checked her mail, she had an offer for a new bank credit card with a \$100 rebate and an interest rate of 16.7%, compounded daily.
 - i) If she had used the new credit card instead, what would her payments have been?
 - ii) How much would she have saved with the new credit card?

2. Sandy is buying a new car for \$36 425, including a shipping charge of \$1300. She is considering the following two credit options:
 - Financing through the dealership at 4.3%, compounded monthly, for a term of 4 years, with the incentive that the dealership will pay the \$1300 shipping charge
 - A bank loan at 4%, compounded monthly, for a term of 5 years
 - a) What are the monthly payments for each option?
 - b) What is the total payment for each option?
 - c) What are the advantages and disadvantages of each option?

3. Bruce is planning to buy and install new tires and rims on his car. The cost is \$1150, which he will use credit to pay. He wants to pay off the loan in 6 months and has two credit options:
 - The tire shop has financing at 16.8%, compounded monthly, and is offering a \$100 immediate rebate.
 - Bruce's existing credit card has a zero balance and a rate of 14.6%, compounded daily.
 - a) Which option will require lower payments?
 - b) Which option will charge less interest?
 - c) Which option will cost him less overall?



PRACTISING

4. While Cassie was in the Caribbean, she used her credit card and her cellphone. When she got home, she received a cellphone bill for \$1450 and a credit card statement with a balance of \$3465.47. She considered these options for being debt-free in 10 months:
 - She could pay the \$1450 cellphone bill with her credit card (which already has a balance of \$3465.47) at 14.3%, compounded daily, and then pay off the entire balance on the credit card in 10 months.
 - She could consolidate both debts using her line of credit at 9.95%, compounded monthly, and pay it off in 10 months.
 - a) What would her monthly payments be for each option?
 - b) How much interest will she have to pay for each option?

5. Troy already had a balance of \$104.75 on his credit card when he used it to purchase items totalling \$128.37. His minimum monthly payment is 4% of the balance or \$20, whichever is greater, and the interest is 18.7%, compounded daily.
 - a) How long will it take Troy to pay off the balance if he pays only the minimum?
 - b) How much interest will he pay?



6. Suella used her new credit card when she paid for ski lift tickets for her two friends and herself. The tickets cost \$448.50 altogether. Her credit card has a promotional offer of 0% interest for 3 months. After this period, the rate is 18.9%, compounded daily.
- If Suella pays \$60 per month, how long will it take her to pay off the balance?
 - How much interest will she pay?
 - If the credit card did not have the promotional offer, how much more interest would Suella have to pay?
7. Joanne needs to use credit to buy a new dinghy, which costs \$3600 plus \$450 for the motor. Joanne wants to have the loan repaid in 4 months. She is considering these two credit options:
- Her line of credit at 10.4%, compounded monthly
 - Her new credit card, which has a \$100 rebate on its first use and an interest rate of 13.7%, compounded daily

Joanne thinks that she should choose her line of credit because it has a lower interest rate. Do you agree?

8. In May, Trish received a bill for \$3500 from a landscaping company. She plans to use her secured line of credit, at 2% above the Bank of Canada rate, to pay the bill. She can afford payments of \$400 each month.
- If the Bank of Canada rate stays at 0.5%, compounded monthly, how long will it take Trish to pay off her line of credit?
 - If the rate increases by 3% in September, how much longer will it take her to pay off her line of credit?
9. While training for a triathlon, Jayce bought new shoes for running and bicycling, a new wetsuit, and a new bicycle. Altogether, the cost was \$2756.43. He has the following two credit options and plans to pay the minimum payment each month:
- A line of credit at 8.9%, compounded monthly, with a minimum monthly payment of \$50
 - A credit card at 15.2%, compounded daily, with a minimum monthly payment of \$60



Form of Credit	Balance (\$)	Interest Rate
credit card A	1408.55	18.5%, compounded daily
credit card B	295.08	19.9%, compounded daily
line of credit	3762.98	7.6%, compounded daily

- How long would it take Jayce to pay off the line of credit? How long would it take him to pay off the credit card?
 - Which credit option do you think Jayce should choose? Explain.
 - If Jayce wants to pay off the loan in a year, what will his payments have to be?
10. Sean has been using his two credit cards and an unsecured line of credit to buy renovation materials, as shown in the chart to the left. He wants to consolidate his debt and pay it off in 2 years, using monthly payments. How much will he save by consolidating his debt?

11. Travis was behind in his rent by \$750 because of unexpected car repair bills. He had no credit cards, and the bank would not give him a loan. He went to a money market for a \$750 loan. He agreed to repay the loan in 3 months for a flat processing fee of \$20, plus a fee of \$20 for each \$100 borrowed.
- How much will Travis have to repay altogether?
 - What annual simple interest rate is equivalent to the fees charged by the money market?
12. Raul got a \$200 cash advance using his credit card, which charges 19.995%, compounded daily. He already had a balance of \$481.73.
- Suppose that Raul wanted to pay off his credit card in 2 months. How much would he need to pay each month? How much interest would he pay?
 - Suppose that Raul wanted to pay \$50 each month until he paid off his credit card. How long would this take? How much interest would he pay?
13. Marla and Clint have agreed to stop using their credit cards and reach a zero balance at the same time.
- Marla's balance is \$1618.76, and the interest is 19.9%, compounded daily. She plans to pay \$150 each month until she pays off her balance.
 - Clint has a balance of \$1893.28 and will make monthly payments of \$175.
- What is the interest rate on Clint's credit card?
 - Who will pay more interest? How much more?
14. Moh wants to buy a new computer for editing his band's music. The computer and peripherals, including microphones and stands, cost \$4785. Tax is an additional 15%. He has decided to apply for the store credit card.
- The credit card has an interest rate of 19.95%, compounded daily, with no payments for a year.
 - There is a \$99.95 administration fee at the time of purchase.
 - If Moh does not pay the balance within the first year, interest will be charged for the whole year. As well, he will need to make minimum monthly payments to have the balance repaid within 6 months.
- How much will Moh need to pay at the time of purchase?
 - What will be the total cost if Moh repays the balance within the year?
 - If the administration fee is considered a simple interest charge over the first year, what interest rate does the fee reflect?
 - If Moh missed the deadline by 1 week, how much more would he have to repay?
 - What monthly payment would Moh need to make to repay the new total in 6 months?
 - How much interest would Moh pay over the 18 months, if he repaid the new balance (the original loan plus interest) in 6 months?



Closing

15. Describe two or more factors that might influence a decision about the best credit option to choose. How do the factors you described relate to each other?

Extending

16. Aiden has found a Jeanette L. Walker print for \$8000 at a gallery. He has these two options for paying:

- A line of credit at 4.3%, compounded monthly
- A loan from the gallery at 4.8%, compounded monthly, with a \$500 immediate rebate

Aiden can afford payments of no more \$330 each month. Compare the payment amounts for the two options, if they are paid off at exactly the same time (to two decimal places for months).

17. James has the following outstanding balances:

Form of Credit	Balance (\$)	Interest Rate	Monthly Payment
bank loan	2775.20	6.8%, compounded monthly	\$500
credit card A	1200.35	19.9%, compounded daily	minimum payment of \$40
credit card B	687.38	19.95%, compounded daily	minimum payment of \$30

- a) How long will it take for James to pay off each balance if he pays \$570 each month (\$70 toward the minimum balances on his credit cards and \$500 toward the bank loan)?
- b) Suppose that James consolidated his loan and credit card balances into a line of credit at 6.8%, compounded monthly. How long would it take him to be debt-free if he paid \$570 monthly?
- c) How much interest would he save if he consolidated his debts?