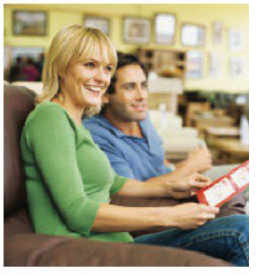
2.3 Solving Problems Involving Credit

1. 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 since collateral is used to guarantee the loan.
2. Bank of Canada Prime Rate: a value set by Canada's central bank, which other financial institutions use to set their interest rates

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

(A)
N = 14.65 × 75
I = 18.7%
PV = 1075 − 100
Pmt = −75
FV = 0
P/Y = 12
C/Y = 365

total paid
= (75)(14.65) = 1099.07 $

I = 1099.07 − 975
I = 124.07 $

(B)
N = (2.38...)(75)
I = 15.4
PV = 1075 − (12)(75)
= 175 $
Pmt = −75
FV = 0
P/Y = 12
C/Y = 365

178.84 $
− 175.00
Interest = 3.84 $

Option B pays way less interest.

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?

(A) $N = 12 \times 5$
$I = 18.5$
$PV = 2436.98$
$Pmt = 62.73298...$
$FV = 0$
$P/Y = 12$
$C/Y = 365$

total paid $= (62.73)(60) = 3763.98$

$I_A = 3763.98 - 2436.98$
$= 1327.00$

(B) $N = 60$
$I = 19$
$PV = 3043.26$
$Pmt = -79.188...$
$FV = 0$
$P/Y = 12$
$C/Y = 365$

total paid $= (79.19)(60) = 4751.33$

$I_B = 4751.33 - 3043.26$
$= 1708.14$

(C) $N = 60$
$I = 9.6$
$PV = 5480.24$
$Pmt = -115.3632...$
$FV = 0$
$P/Y = 12$
$C/Y = 12$

total paid $= 6921.79$ $

$I_C = 6921.79 - 5480.24$
$= 1441.55$

$Savings = (I_A + I_B) - I_C$
$= (1327.00 + 1708.14) - 1441.55$ $
$= \boxed{1593.59\ \$}$

By consolidating Nicki's two debts into one with a lower interest rate (line of credit), she saved $1593.59 in interest.

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.

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?

a) Payday loan cost $100

Cash advance for 1 month

$FV = P(1+i)^n$ $\quad i = \frac{0.1999}{365}$

$= 475\left(1+\frac{.1999}{365}\right)^{31}$ $\quad n = 31$ days

$= 483.13 - 5\$$ pmt

$FV = 478.13\left(1+\frac{.1999}{365}\right)^{30}$

$= 486.05$

$I = 486.05 - 475\$$

$= 11.05 + 5$ pmt

$= \boxed{16.05\$}$

Cash advance is way cheaper than the $100 payday fee.

b) N = 61

I = 114.52

PV = 475

Pmt = 0

FV = -575

P/Y = 365

C/Y = 365

payday loan BAD

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?

→ (11 pmts)(150$)

$= 1650\$$

Balance owing = $2643.65 - 1650$

$= \boxed{993.65\$}$ by the end of the year.

N = 12

I = 19.95

PV = 2643.65

Pmt = 0

FV = -3222.06

PY = 12

CY = 12

penalty = $578.41

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