

Credit Cards

Introduction

We start with a visual guide to reading the credit card statement. You can also have a look at these:

<https://www.cibc.com/en/personal-banking/credit-cards/how-to-read-your-credit-card-statement.html>

<https://www.finder.com/ca/understanding-credit-card-statement-features>

Next, a few talking points on the Cardholder agreement - the same that we use to calibrate questions and answers in both case studies. This can be used as a reading comprehension exercise (of the 'fine print').

Case Study 1: Katie

Understanding credit card statements

This case study shows what happens when Katie uses her credit card as a convenient payment method and a tool to build her credit record. Frankly, little financial knowledge is required. But good personal finance habits are key. They are described in the Keep-up section of the FinStart website.

What if Katie's payment is late by 1 day?

Even one day is quite costly and the consequences drag on for a few months. To understand what's going on Katie needs to know how to read her credit card agreement (each credit card is slightly different). She also needs to be able to do some calculations. She'll realize that not all parameters for these calculations can be found in her agreement. The last problem in this case study is a reflective culminating activity, Lessons Learnt.

Case Study 2: Miguel

What if Miguel only makes the minimum payment?

Just like with a late payment, making only a minimum payment has severe consequences. And just like Katie, once Miguel falls into this situation, it takes effort and knowledge to figure it out.

Both case studies drive home the message that personal finance problems are not always solved by applying a single mathematical formula. What works is tabulating monthly cashflows, sometimes for several years. Ability to set this up in Excel (or write some code in a programming language) can help. Paying attention to mundane rules, like proper day count and accounting for holidays, is important. That message is also seen in the student-debt case study (notably Problem 2) in the Loans chapter.

More on credit cards in Loans

One of the case studies in the Loans section compares the merits of different forms of financing a small purchase, a laptop. It drives home the message that credit cards can quickly turn into loans.

Green text in Solutions highlights additional talking points.



Teaching with FinStart

Active learning module:

Morgan is turning 17 this year. His grandma decides he's a grown boy and, much to the distaste of Morgan's parents...

How It Works video

Talk Like a Banker (word game)

Take a FinStart Quiz

Reference: Credit Card pages

- Apply
- Keep up
- Cancel

<https://www.finstart.ca/credit-cards.html>

A 6-minute video on the *For Teachers* page shares a number of ideas about teaching with FinStart.

Introduction

Credit Card Statement



Your TD® Aeroplan® Visa® Credit Card statement at a glance.
Please take a few minutes to familiarize yourself with your statement.

TD Aeroplan® Visa® Account
MR. G RAYMOND 0123 4567 8910 1234

STATEMENT DATE: February 1, 2014 1 of 2
PREVIOUS STATEMENT: January 2, 2014

TRANSACTION DATE	POSTING DATE	ACTIVITY DESCRIPTION	AMOUNT (€)
		PREVIOUS STATEMENT BALANCE	\$000.00
JAN 1	JAN 3	ABC COMPANY	\$000.00
JAN 10	JAN 13	GROCERY STORE	\$000.00
JAN 10	JAN 13	PAYMENT - THANK YOU	\$000.00
JAN 17	JAN 19	PHARMACY	\$000.00
JAN 25	JAN 25	RETAIL INTEREST	\$000.00
NET AMOUNT OF MONTHLY ACTIVITY			\$000.00
TOTAL NEW BALANCE			\$000.00

CONTACT INFORMATION
Customer Service/Lost & Stolen: 1-800-983-8472
TTY Inquiries (with hearing loss): 1-800-361-3194
Aeroplan Program: 1-800-361-5373
Aeroplan Website: www.aeroplan.com

AEROPLAN MILES
Aeroplan® Number #: 0
Miles Earned on Purchases +: 00.000
Bonus/Adjustments Miles Earned +: 00.000
Total Miles Earned = 00.000

PAYMENT INFORMATION
Minimum Payment \$000.00
Payment Due Date: **Month XX, 2014**
Credit Limit: \$00,000
Available Credit: **\$00,000**
Annual Interest Rate: Purchases 19.99%, Cash Advances 22.99%

Estimated Time to Pay
The estimated time to pay your New Balance in full if you pay only the Minimum Payment each month is: 1 year(s) and 11 month(s).

TD MESSAGE CENTRE:
THANK YOU FOR CHOOSING THE TD® AEROPLAN® VISA® CARD.
SWITCH TO RECEIVE ONLINE STATEMENTS FOR YOUR TD CREDIT CARD AND ENJOY EASY, SECURE ACCESS TO YOUR ACCOUNT.

CALCULATING YOUR BALANCE

Previous Balance	\$000.00
Payments & Credits	\$000.00
Purchases & Other Charges	\$000.00
Cash Advances	\$000.00
Interest	\$000.00
Fees	\$000.00
NEW BALANCE	\$000.00

NEW BALANCE \$0,000.00 **MINIMUM PAYMENT** \$000.00 **PAYMENT DUE DATE** Month XX, 2014 **AMOUNT PAID** \$

TD CANADA TRUST
P.O.B./C.P. 611
AGINCOURT, ONTARIO M1S 5J7

MR. G RAYMOND
123 ANY STREET, SUITE 3000
ANYTOWN, PR P0S 0D0

TD® Aeroplan® Visa® Account
Account Number: 0123 4567 8910 1234

1. Payments can be made via:
• EasyLine™ Telephone Banking
• EasyWeb™ Internet banking
• The Green Machine®
• TD Canada Trust Branch
• Mail

2. Make cheques payable to TD Canada Trust.
3. Detach and return with payment.

This statement is for illustrative purposes only and does not represent actual customer information.

Source accessed August 28, 2020:

https://www.tdcanadatrust.com/document/PDF/banking/TD_A_Consumer%20SI_10_4PDF_nc.pdf

Cardholder Agreement

If you ever have to pay interest charges and fees on your credit card, the really important information is not on your statement, but rather in the cardholder agreement. In our case studies, we refer to the WalMart Canada Bank Mastercard Cardholder Agreement. Keep in mind terms differ among providers and change over time. For example, in the fall of 2020 some credit card providers will be rolling out a new minimum payment rule. Instead of the ‘bigger of 3% and \$10’, they set the minimum payment as ‘all past interest charges and fees’.

A summary of key points is sent to cardholders along with the first card (Walmart calls it the Fulfilment Kit).

<http://i.walmartimages.ca/financial-services/pdf/credit-card-member-agreement-existing-EN.pdf>

Points worth highlighting:

Excerpt from the Cardholder Agreement	Comment
<p>“This Agreement is your promise to pay Walmart Canada Bank all amounts owing on your Account”, and “By signing, activating or using your Card or accessing your Account in any way, you are accepting the terms and conditions of this Agreement, which includes the Disclosure Statement”.</p>	<p>Using the card is equivalent to a signature on the agreement.</p>
<p>“This Agreement replaces any previous cardholder agreement provided to you in connection with your Account, however, the promises you made and consents you gave in your application for the Card continue to apply”.</p>	<p>Asymmetry: The terms from the original application carry on but those of the agreement can be revised anytime by the provider.</p>
<p>19.89% is Our Preferred Rate. 21.49% is the Cash Interest Rate. 25.99% is the Standard Rate. “If you do not pay the minimum payment by the payment due date for any 2 billing periods within any 12 month period, the Standard Rate will apply”.</p>	<p>1. There is more than one interest rate you can be charged. 2. Capital letters mean it’s a ‘defined term’. It may mean something different than what you expect. Definitions are usually provided at the very beginning or very end of legal agreements.</p>
<p>“The payment due date shown on your monthly statement will be at least 21 days after the last day of the statement period shown on your monthly statement. This period of time is referred to as an interest-free grace period. This means that interest will not be charged on your purchases and fees if you pay the full outstanding balance by the payment due date shown on your statement. There is no interest-free grace period for cash advances (including balance transfers, cash-like transactions and transactions using convenience cheques that we may issue to you) or their associated fees.</p>	<p>Re: text in bold, balance-transfer cards often advertise, as a special promotion, a zero-interest initial period, say 6 months. They can be used in certain situations to manage down credit card debt. Case 1, Problem 1, ix).</p>
<p>“When interest is charged, it is calculated using the “average daily balance method”, and charged to your Account on the last day of each billing period”.</p>	<p>This is all we get upfront, but details are given on page 9. We summarize the steps in this calculation in Problem 4B.</p>
<p>“We will apply your Minimum Payment as follows: (a) first to any accrued interest charges; (b) then to any previously billed amounts; and (c) then to any unbilled amounts. If within any category noted above different rates apply, we will apply your Minimum Payment to those amounts which bear the lowest interest rate first”.</p>	<p>This important information is provided much further below (p7, pages are not</p>

<p><i>“If you do not pay at least the Minimum Payment by the payment due date <...>, you may lose the benefit of any promotional offers in which you are participating”.</i></p>	<p>numbered). Case 1, Problem 3B.</p>
<p><i>“The minimum payment shown on each monthly statement will be the sum of (i) any previous unpaid minimum payments; (ii) any charges for insurance or warranty products you have chosen to purchase from us; and (iii) any amount by which the Balance exceeds your credit limit PLUS the greater of (a) \$10.00; OR (b) 3% of the Balance, plus any Over Credit Limit Fees and any NSF Cheque Fees. However, if the Balance is less than \$10.00, then the minimum payment will be the full Balance”.</i></p>	<p>If you’re so tight for money that you operate at the level of minimum payment, you need to know a lot of detail to avoid trouble that results from not making the minimum payment when due.</p>
<p><i>“If you use your Card for a transaction in a foreign currency, the foreign currency will be converted to Canadian Dollars before the transaction is recorded on your Account. Transactions made in any currency other than U.S. Dollars will be converted first to U.S. Dollars and then to Canadian Dollars. We will charge you for the transaction in Canadian Dollars at the exchange rate established by MasterCard International in effect on the date that we post the transaction to your Account plus our fee of 2.5% of the amount of the foreign currency transaction after the foreign currency has been converted to Canadian Dollars”.</i></p>	<p>Foreign currency transactions using credit cards can be expensive (two conversions, a 2.5% fee) and you won’t know the rate until later. We discuss better ways on the Foreign Exchange page of FinStart, accessible from the Chequing Accounts page.</p>
<p><i>“Other Fees”.</i></p> <p><i>” Although we establish a Credit Limit, we may, from time to time and at our discretion, approve charges that cause your Balance to exceed the Credit Limit” (further down, p7).</i></p>	<p>From \$4 for certain transactions, each, to \$20 for over-credit-limit transactions or dishonoured payments. We discuss how to protect yourself from these happening to you on the Keep-up page in Credit Cards. The over-limit situation is particularly interesting - at their discretion the provider may allow you to go over limit and then will charge you fees.</p>
<p><i>“Payments do not immediately adjust your available credit. This generally occurs within one to three business days following our receipt and clearing of your payment”.</i></p>	<p>If you are running your card close to the limit (not recommended if you care about your credit score), you need to know this kind of detail - it takes a few days for payment to be fully reflected in your account.</p>
<p><i>“If you have a complaint or a problem regarding any products or services you purchased using your Card or your Account, you must still pay all charges on your Account and resolve the problem directly with the merchant”.</i></p>	<p>Good to know.</p>
<p><i>“Under the MasterCard Zero Liability policy, you will not be liable for any unauthorized purchases that are made with your Card if the following conditions are met...” (p11).</i></p> <p><i>“You will be responsible for transactions that occur under the following circumstances, unless you prove to us that you took reasonable precautions to protect and safeguard your Card and your PIN from becoming available or accessible to another person, but that despite having taking such precautions, your Card and your PIN or other security code were stolen or fraudulently obtained by an unauthorized person...”</i></p>	<p>Ditto.</p>

Case Study 1: Katie

Credit Card Statement Excerpt for Problems 1-6

Katie has a credit card and uses it for large purchases. She makes sure to visit her bank's local branch every month before her credit card bill is due to pay her balance. Katie knows the dangers of credit card debt - she's never missed a payment.

Here's her credit card statement from April 2020.

Statement period: Mar 23nd, 2020 - Apr 22nd, 2020

Payment due date	May 13 th , 2019
Minimum payment	\$49.00
Past due	\$0.00
Previous balance (Feb 23 st - March 22 st)	\$1,204.93
Payments & credits	- \$1,204.93
New Purchases & debits	+ \$1,615.55
Cash advances / balance transfers	\$0.00
Fees	\$0.00
Interest	\$0.00
New Purchases & debits	+ \$1,615.55
Total new balance	\$1,615.55

Actual interest rates

Purchases	19.89%
Cash Advances	21.49%

Transaction details

Item	Transaction Date	Post Date	Description	Amount
1	Mar 23	Mar 24	MOUNTAIN BIKES TORONTO ON	\$999.00
2	Mar 30	Mar 31	YORK BOOKSTORE TORONTO ON	\$562.57
3	Apr 7	Apr 8	TELUS MOBILE BARRIE ON	\$39.99
4	Apr 12	Apr 12	PAYMENT RECEIVED - Thank You	- \$1,204.93
5	Apr 22	Apr 23	NETFLIX.COM ON	\$13.99

Understanding Credit Card Statements

Problem 1 (no calculations required)

Inspect Katie's credit card statement and answer the following questions.

i)	What was her balance in the March statement for the period from 23 February - 22 March?
ii)	Was the March statement balance paid in full and on time? Hint: there are 3 ways you can tell.
iii)	What was her balance in the April statement for the period from 23 March - 22 April?
iv)	What is the payment due date for the April statement?
v)	What is Katie's minimum payment in the April statement?
vi)	What is the stated annual interest rate on the credit card for non-cash purchases? In the Cardholder Agreement, find how much the rate would increase if Katie failed to make the minimum payment twice in a 12-month period.
vii)	The actual annual interest rate paid by the credit card holder can exceed the stated annual interest rate. Explain when this could happen and what would cause this situation.
viii)	What is the stated annual interest rate on Katie's credit card for cash advances?
ix)	Explain what the interest-free grace period is and find in the Cardholder Agreement in what situations Katie is eligible for it and when she isn't.
x)	For each transaction in the current statement period, how many interest-free days Katie gets.

Problem 2 (no calculations required)

Assume that Katie has not made any credit card transactions after 22 April 2020 except the payment of \$1,615.55 on 13 May 2020. What "Total new balance" can she expect on the May statement, i.e. for the period from 23 April to 22 May?

Consequences of Late Payment - by 1 Day

If Katie were late paying her balance on the April statement even by one day, she would see the consequences in more than one subsequent statement - through interest charges. We'll look at her statements month by month. We'll assume she makes no additional transactions.

Part 1: May statement - interest charges for 23 March – 22 April (the April period)

Problem 3A (no calculations required)

Assume that the credit card company received Katie's payment of \$1,615.55 one day after the payment day, i.e. 14 May, and that Katie had not had any other credit card transactions after 22 April.

i)	Is Katie eligible for interest-free grace period for April period?
ii)	Do you expect any interest rate charges for the April period to be shown in the May statement?
iii)	The April period interest charges shown in the May statement are calculated up to what day?
iv)	On what date will the April period interest charges be posted?
v)	Are April period interest charges subject to interest charges (i.e. interest-on-interest) throughout the May period?
vi)	What is the payment due date on the May statement?

Problem 3B (calculations required)

Calculate interest rate charges for the April period using "average daily balance method" as per following steps:

- i) Calculate the outstanding credit card balance on the following days of the April period. What will be the balances on other days, for example March 25, April 4, and April 15?

Date	Balance	Calculations
23-Mar		
30-Mar		
7-Apr		
22-Apr		

- ii) How many calendar days are there in the April period?
 iii) Calculate the average daily balance in the April period.
 iv) Calculate the daily interest rate.
 v) Calculate the interest payment for the April period.

Part 2: June statement - interest charges for 23 April – 22 May (the May period)

Problem 4A (no calculations required)

Assume that Katie paid in full and on time the balance shown in the May statement.

- i) Do you expect any interest rate charges for the May period to be shown in the June statement?
- ii) Is Katie eligible for interest-free grace period for the May period?
- iii) May period interest charges shown in the June statement are calculated up to what day?
- iv) On what date May period interest charges are posted?
- v) Are May period interest charges subject to interest charges (i.e. interest-on-interest) throughout June period?
- vi) What is the payment due date on the June statement?

Problem 4B (calculations required)

Calculate interest rate charges for the May period using the “average daily balance method” as per following steps:

- i) Calculate the outstanding credit card balance on the relevant days of the May period (as in Question 14a)
- ii) Count the number of calendar days in the May period
- iii) Calculate the average daily balance in May period
- iv) Calculate the daily interest rate
- v) Calculate the interest payment for May period

Part 3: Subsequent statements (no calculations required)

Problem 5

Do you expect to see any interest charges in the July statement? What about August? And September?

Problem 6

Lessons learnt from the late payment:

- i) How much did it cost Katie to miss the payment date by just one day? What percent of the amount she owed (\$1,615.55) is that? How does this compare with interest she can earn on a savings account? (check www.ratehub.com)
- ii) What could have Katie done to minimize her interest rate charges once she realized that her payment was late?
- iii) Why would it be more expensive for Katie to keep using the credit card while she has an outstanding interest balance?
- iv) Can you think of reasons Katie’s payment could be late by a day, assuming she has not forgotten about it?
- v) What steps could Katie take to protect herself from credit card debt.

Case Study 2: Miguel

Consequences of Making Only a Minimum Payment

Use the following information to solve problem 7.

Miguel used his credit card to buy a laptop during the back-to-school sale on Wednesday evening of Sep 18, 2019. With his finances tight, Miguel wanted to maximize the credit card interest-free grace period. He timed the computer purchase to ensure that the transaction is posted to his credit card account the next day, 19 Sep, which is the first day of his October credit card statement period.

Miguel received his October credit card statement on Friday, 25 October. On the week-end, he decided to calculate how much time it would take and how much it would cost in interest if he pursued the minimum payment strategy.

Statement period: Sep 19, 2019 - Oct 18, 2019

Payment due date	Nov 8, 2019
Minimum payment	\$16.00
Past due	\$0.00
Previous balance (Aug 19 - Sep 18, 2019)	\$210.95
Payments & credits	- \$210.95
New Purchases & debits	+ \$515.00
Cash advances / balance transfers	\$0.00
Fees	\$0.00
Interest	\$0.00
New Purchases & debits	+ \$515.00
Total new balance	\$515.00

Actual interest rates

Purchases	19.89%
Cash Advances	21.49%

Item	Transaction Date	Post Date	Description	Amount
1	Sep 18	Sep 19	BEST BUY REGINA, SK	\$515.00
2	Oct 9	Oct 9	PAYMENT RECEIVED - Thank You	- \$210.95

Problem 7 (no calculations required for i) through xv))

Answer the following questions in sequence.

i)	What was the balance in the September statement for the period 19 August - 18 September 2019?
ii)	Was the September statement balance paid in full and on time?
iii)	What is the balance in the October statement for the period 19 September - 18 October 2019?
iv)	What is the payment due date shown in the October statement?
v)	What are the transaction date and the posting date associated with the laptop purchase?
vi)	Which date, transaction or posting, determined that the laptop purchase was included in October statement?
vii)	What is interest-free grace period for the transaction posted on 19 September 2019?
viii)	Is Miguel eligible for the interest-free grace period?
ix)	What is the minimum payment that Miguel has to make by the due date?
x)	How was the minimum payment calculated?
xi)	Would Miguel incur any interest charges if he paid his full balance of \$515.00 by 8 November 2019?
xii)	Would Miguel be eligible for the interest-free grace period if he made the minimum payment of \$16.00 by 8 November 2019?
xiii)	Would Miguel incur any interest charges if he made minimum payment of \$16.00 by 8 November 2019?
xiv)	What is the stated annual interest rate on the credit card for non-cash purchases?
xv)	What is the daily interest Miguel will be charged if he pursues minimum payment strategy?
xvi)	What amount of interest charges would be shown on the November statement should Miguel make the minimum payment only on 8 November? Use the average daily balance method to arrive at the answer, namely: <ol style="list-style-type: none"> Calculate the average daily balance in October period. Count the number of days in the October period. Calculate the daily interest rate that is applied to the average daily balance. Calculate interest charges for the October period.
xvii)	What will the minimum payment be on November statement? Use the following method: <ol style="list-style-type: none"> Calculate 3% of the November statement balance. Round up the above number to the nearest dollar. Set the minimum payment to the bigger of the above number and \$10.00.
xviii)	What will the payment due date be on the November statement?
xix)	What amount of interest charges will be shown on the December statement should Miguel continue making minimum payment only? Use the average daily balance method to arrive at the answer, namely: <ol style="list-style-type: none"> Calculate the average daily balance in the November period. Count the number of days in November period. Calculate the daily interest rate that is applied to the average daily balance. Calculate interest charges for the November period.
xx)	What will the payment due date be on the December statement?

xxi)	<p>Examine the attached tabulated summary of future monthly statements associated with minimum payment strategy (below the last problem):</p> <ol style="list-style-type: none"> a. How many months will it take to pay back the credit card debt? b. What will be total interest charges Miguel will have to pay?
xxii)	<p>Without doing any calculations, guesstimate how the above-estimated numbers of payment months and total interest charges would change if:</p> <ol style="list-style-type: none"> a. The stated annual interest credit card interest increased? b. The credit card provider set minimum payment without rounding it up to the nearest dollar? c. Miguel missed two minimum payments within a year? d. The credit card provider increased the interest-free grace period to 30 days?
xxiii)	<p>How may the following strategies help Miguel accelerate the repayment of his credit card debt and reduce the overall interest charges? Explain your reasoning.</p> <ol style="list-style-type: none"> a. Take a personal unsecured loan of \$515.00 at a 15% rate and pay the credit card balance in full by 8 November 2019. b. Apply for a new no-fee credit card with a promotional offer to transfer the outstanding balance at a small fee and pay 0% interest rate on the transferred balance for 12 months. c. Increase each monthly payment by \$10.00 on top of the minimum payment. d. Make credit card payments as soon as he has cash available, prior to the payment due dates.
xxiv)	<p>Write a computer program (Python, VBA, Java) or build an Excel spreadsheet to model the minimum payment strategy for Miguel.</p>

Attachment for Problem 7, item xxi.

Yes, this looks intimidating. We did the calculations for you as an illustration. In real life it's highly unlikely you'd have to do anything like this - unless you get into trouble with too much debt you have difficulties repaying. If that ever happens to you, it's best to seek help from a credit counselling agency.

Period Start Date	Period End Date	Payment Due Date	Days in Period	Month	Period Balance up to Payment Due Date	Period Balance after Payment Due Date	End of Period Balance	End of Period Balance plus Interest Charge	Days in Period up to Payment Due Date	Days in Period after Payment Due Date	Average Daily Balance	Daily Interest Rate	Period Interest Charge	Minimum Payment (rounded up to nearest dollar)
19-Aug-19	18-Sep-19	9-Oct-19	31											
19-Sep-19	18-Oct-19	8-Nov-19	30		\$ 515.00		\$ 515.00	\$ 523.42	21	9	\$515.00	0.0545%	\$ 8.42	\$ 16.00
19-Oct-19	18-Nov-19	9-Dec-19	31	1	\$ 523.42	\$ 507.42	\$ 507.42	\$ 516.17	21	10	\$518.26	0.0545%	\$ 8.75	\$ 16.00
19-Nov-19	18-Dec-19	8-Jan-20	30	2	\$ 516.17	\$ 500.17	\$ 500.17	\$ 508.53	21	9	\$511.37	0.0545%	\$ 8.36	\$ 16.00
19-Dec-19	18-Jan-20	8-Feb-20	31	3	\$ 508.53	\$ 492.53	\$ 492.53	\$ 501.04	21	10	\$503.37	0.0545%	\$ 8.50	\$ 16.00
19-Jan-20	18-Feb-20	10-Mar-20	31	4	\$ 501.04	\$ 485.04	\$ 485.04	\$ 493.39	21	10	\$495.88	0.0543%	\$ 8.35	\$ 15.00
19-Feb-20	18-Mar-20	8-Apr-20	29	5	\$ 493.39	\$ 478.39	\$ 478.39	\$ 486.10	21	8	\$489.25	0.0543%	\$ 7.71	\$ 15.00
19-Mar-20	18-Apr-20	9-May-20	31	6	\$ 486.10	\$ 471.10	\$ 471.10	\$ 479.21	21	10	\$481.26	0.0543%	\$ 8.11	\$ 15.00
19-Apr-20	18-May-20	8-Jun-20	30	7	\$ 479.21	\$ 464.21	\$ 464.21	\$ 471.95	21	9	\$474.71	0.0543%	\$ 7.74	\$ 15.00
19-May-20	18-Jun-20	9-Jul-20	31	8	\$ 471.95	\$ 456.95	\$ 456.95	\$ 464.82	21	10	\$467.11	0.0543%	\$ 7.87	\$ 14.00
19-Jun-20	18-Jul-20	8-Aug-20	30	9	\$ 464.82	\$ 450.82	\$ 450.82	\$ 458.33	21	9	\$460.62	0.0543%	\$ 7.51	\$ 14.00
19-Jul-20	18-Aug-20	8-Sep-20	31	10	\$ 458.33	\$ 444.33	\$ 444.33	\$ 451.97	21	10	\$453.81	0.0543%	\$ 7.65	\$ 14.00
19-Aug-20	18-Sep-20	9-Oct-20	31	11	\$ 451.97	\$ 437.97	\$ 437.97	\$ 445.51	21	10	\$447.46	0.0543%	\$ 7.54	\$ 14.00
19-Sep-20	18-Oct-20	8-Nov-20	30	12	\$ 445.51	\$ 431.51	\$ 431.51	\$ 438.71	21	9	\$441.31	0.0543%	\$ 7.19	\$ 14.00
19-Oct-20	18-Nov-20	9-Dec-20	31	13	\$ 438.71	\$ 424.71	\$ 424.71	\$ 432.02	21	10	\$434.19	0.0543%	\$ 7.31	\$ 13.00
19-Nov-20	18-Dec-20	8-Jan-21	30	14	\$ 432.02	\$ 419.02	\$ 419.02	\$ 426.00	21	9	\$428.12	0.0543%	\$ 6.98	\$ 13.00
19-Dec-20	18-Jan-21	8-Feb-21	31	15	\$ 426.00	\$ 413.00	\$ 413.00	\$ 420.11	21	10	\$421.81	0.0543%	\$ 7.11	\$ 13.00
19-Jan-21	18-Feb-21	11-Mar-21	31	16	\$ 420.11	\$ 407.11	\$ 407.11	\$ 414.13	21	10	\$415.91	0.0545%	\$ 7.03	\$ 13.00
19-Feb-21	18-Mar-21	8-Apr-21	28	17	\$ 414.13	\$ 401.13	\$ 401.13	\$ 407.40	21	7	\$410.88	0.0545%	\$ 6.27	\$ 13.00
19-Mar-21	18-Apr-21	9-May-21	31	18	\$ 407.40	\$ 394.40	\$ 394.40	\$ 401.21	21	10	\$403.21	0.0545%	\$ 6.81	\$ 13.00
19-Apr-21	18-May-21	8-Jun-21	30	19	\$ 401.21	\$ 388.21	\$ 388.21	\$ 394.71	21	9	\$397.31	0.0545%	\$ 6.50	\$ 12.00
19-May-21	18-Jun-21	9-Jul-21	31	20	\$ 394.71	\$ 382.71	\$ 382.71	\$ 389.31	21	10	\$390.84	0.0545%	\$ 6.60	\$ 12.00
19-Jun-21	18-Jul-21	8-Aug-21	30	21	\$ 389.31	\$ 377.31	\$ 377.31	\$ 383.62	21	9	\$385.71	0.0545%	\$ 6.31	\$ 12.00
19-Jul-21	18-Aug-21	8-Sep-21	31	22	\$ 383.62	\$ 371.62	\$ 371.62	\$ 378.03	21	10	\$379.75	0.0545%	\$ 6.41	\$ 12.00
19-Aug-21	18-Sep-21	9-Oct-21	31	23	\$ 378.03	\$ 366.03	\$ 366.03	\$ 372.35	21	10	\$374.16	0.0545%	\$ 6.32	\$ 12.00
19-Sep-21	18-Oct-21	8-Nov-21	30	24	\$ 372.35	\$ 360.35	\$ 360.35	\$ 366.38	21	9	\$368.75	0.0545%	\$ 6.03	\$ 11.00
19-Oct-21	18-Nov-21	9-Dec-21	31	25	\$ 366.38	\$ 355.38	\$ 355.38	\$ 361.51	21	10	\$362.83	0.0545%	\$ 6.13	\$ 11.00
19-Nov-21	18-Dec-21	8-Jan-22	30	26	\$ 361.51	\$ 350.51	\$ 350.51	\$ 356.37	21	9	\$358.21	0.0545%	\$ 5.86	\$ 11.00
19-Dec-21	18-Jan-22	8-Feb-22	31	27	\$ 356.37	\$ 345.37	\$ 345.37	\$ 351.33	21	10	\$352.82	0.0545%	\$ 5.96	\$ 11.00
19-Jan-22	18-Feb-22	11-Mar-22	31	28	\$ 351.33	\$ 340.33	\$ 340.33	\$ 346.20	21	10	\$347.78	0.0545%	\$ 5.87	\$ 11.00
19-Feb-22	18-Mar-22	8-Apr-22	28	29	\$ 346.20	\$ 335.20	\$ 335.20	\$ 340.44	21	7	\$343.45	0.0545%	\$ 5.24	\$ 11.00
19-Mar-22	18-Apr-22	9-May-22	31	30	\$ 340.44	\$ 329.44	\$ 329.44	\$ 335.13	21	10	\$336.89	0.0545%	\$ 5.69	\$ 11.00
19-Apr-22	18-May-22	8-Jun-22	30	31	\$ 335.13	\$ 324.13	\$ 324.13	\$ 329.56	21	9	\$331.83	0.0545%	\$ 5.42	\$ 10.00
19-May-22	18-Jun-22	9-Jul-22	31	32	\$ 329.56	\$ 319.56	\$ 319.56	\$ 325.07	21	10	\$326.33	0.0545%	\$ 5.51	\$ 10.00
19-Jun-22	18-Jul-22	8-Aug-22	30	33	\$ 325.07	\$ 315.07	\$ 315.07	\$ 320.33	21	9	\$322.07	0.0545%	\$ 5.27	\$ 10.00
19-Jul-22	18-Aug-22	8-Sep-22	31	34	\$ 320.33	\$ 310.33	\$ 310.33	\$ 315.69	21	10	\$317.11	0.0545%	\$ 5.36	\$ 10.00
19-Aug-22	18-Sep-22	9-Oct-22	31	35	\$ 315.69	\$ 305.69	\$ 305.69	\$ 310.97	21	10	\$312.47	0.0545%	\$ 5.28	\$ 10.00

19-Sep-22	18-Oct-22	8-Nov-22	30	36	\$ 310.97	\$ 300.97	\$ 300.97	\$ 306.00	21	9	\$307.97	0.0545%	\$ 5.03	\$ 10.00
19-Oct-22	18-Nov-22	9-Dec-22	31	37	\$ 306.00	\$ 296.00	\$ 296.00	\$ 301.12	21	10	\$302.78	0.0545%	\$ 5.11	\$ 10.00
19-Nov-22	18-Dec-22	8-Jan-23	30	38	\$ 301.12	\$ 291.12	\$ 291.12	\$ 295.99	21	9	\$298.12	0.0545%	\$ 4.87	\$ 10.00
19-Dec-22	18-Jan-23	8-Feb-23	31	39	\$ 295.99	\$ 285.99	\$ 285.99	\$ 290.94	21	10	\$292.77	0.0545%	\$ 4.95	\$ 10.00
19-Jan-23	18-Feb-23	11-Mar-23	31	40	\$ 290.94	\$ 280.94	\$ 280.94	\$ 285.80	21	10	\$287.71	0.0545%	\$ 4.86	\$ 10.00
19-Feb-23	18-Mar-23	8-Apr-23	28	41	\$ 285.80	\$ 275.80	\$ 275.80	\$ 280.12	21	7	\$283.30	0.0545%	\$ 4.32	\$ 10.00
19-Mar-23	18-Apr-23	9-May-23	31	42	\$ 280.12	\$ 270.12	\$ 270.12	\$ 274.80	21	10	\$276.90	0.0545%	\$ 4.68	\$ 10.00
19-Apr-23	18-May-23	8-Jun-23	30	43	\$ 274.80	\$ 264.80	\$ 264.80	\$ 269.24	21	9	\$271.80	0.0545%	\$ 4.44	\$ 10.00
19-May-23	18-Jun-23	9-Jul-23	31	44	\$ 269.24	\$ 259.24	\$ 259.24	\$ 263.74	21	10	\$266.02	0.0545%	\$ 4.49	\$ 10.00
19-Jun-23	18-Jul-23	8-Aug-23	30	45	\$ 263.74	\$ 253.74	\$ 253.74	\$ 258.00	21	9	\$260.74	0.0545%	\$ 4.26	\$ 10.00
19-Jul-23	18-Aug-23	8-Sep-23	31	46	\$ 258.00	\$ 248.00	\$ 248.00	\$ 252.30	21	10	\$254.77	0.0545%	\$ 4.30	\$ 10.00
19-Aug-23	18-Sep-23	9-Oct-23	31	47	\$ 252.30	\$ 242.30	\$ 242.30	\$ 246.51	21	10	\$249.08	0.0545%	\$ 4.21	\$ 10.00
19-Sep-23	18-Oct-23	8-Nov-23	30	48	\$ 246.51	\$ 236.51	\$ 236.51	\$ 240.49	21	9	\$243.51	0.0545%	\$ 3.98	\$ 10.00
19-Oct-23	18-Nov-23	9-Dec-23	31	49	\$ 240.49	\$ 230.49	\$ 230.49	\$ 234.50	21	10	\$237.27	0.0545%	\$ 4.01	\$ 10.00
19-Nov-23	18-Dec-23	8-Jan-24	30	50	\$ 234.50	\$ 224.50	\$ 224.50	\$ 228.28	21	9	\$231.50	0.0545%	\$ 3.78	\$ 10.00
19-Dec-23	18-Jan-24	8-Feb-24	31	51	\$ 228.28	\$ 218.28	\$ 218.28	\$ 222.09	21	10	\$225.06	0.0545%	\$ 3.80	\$ 10.00
19-Jan-24	18-Feb-24	10-Mar-24	31	52	\$ 222.09	\$ 212.09	\$ 212.09	\$ 215.77	21	10	\$218.86	0.0543%	\$ 3.69	\$ 10.00
19-Feb-24	18-Mar-24	8-Apr-24	29	53	\$ 215.77	\$ 205.77	\$ 205.77	\$ 209.13	21	8	\$213.01	0.0543%	\$ 3.36	\$ 10.00
19-Mar-24	18-Apr-24	9-May-24	31	54	\$ 209.13	\$ 199.13	\$ 199.13	\$ 202.60	21	10	\$205.90	0.0543%	\$ 3.47	\$ 10.00
19-Apr-24	18-May-24	8-Jun-24	30	55	\$ 202.60	\$ 192.60	\$ 192.60	\$ 195.85	21	9	\$199.60	0.0543%	\$ 3.25	\$ 10.00
19-May-24	18-Jun-24	9-Jul-24	31	56	\$ 195.85	\$ 185.85	\$ 185.85	\$ 189.10	21	10	\$192.63	0.0543%	\$ 3.25	\$ 10.00
19-Jun-24	18-Jul-24	8-Aug-24	30	57	\$ 189.10	\$ 179.10	\$ 179.10	\$ 182.13	21	9	\$186.10	0.0543%	\$ 3.03	\$ 10.00
19-Jul-24	18-Aug-24	8-Sep-24	31	58	\$ 182.13	\$ 172.13	\$ 172.13	\$ 175.15	21	10	\$178.91	0.0543%	\$ 3.01	\$ 10.00
19-Aug-24	18-Sep-24	9-Oct-24	31	59	\$ 175.15	\$ 165.15	\$ 165.15	\$ 168.04	21	10	\$171.92	0.0543%	\$ 2.90	\$ 10.00
19-Sep-24	18-Oct-24	8-Nov-24	30	60	\$ 168.04	\$ 158.04	\$ 158.04	\$ 160.73	21	9	\$165.04	0.0543%	\$ 2.69	\$ 10.00
19-Oct-24	18-Nov-24	9-Dec-24	31	61	\$ 160.73	\$ 150.73	\$ 150.73	\$ 153.39	21	10	\$157.51	0.0543%	\$ 2.65	\$ 10.00
19-Nov-24	18-Dec-24	8-Jan-25	30	62	\$ 153.39	\$ 143.39	\$ 143.39	\$ 145.84	21	9	\$150.39	0.0543%	\$ 2.45	\$ 10.00
19-Dec-24	18-Jan-25	8-Feb-25	31	63	\$ 145.84	\$ 135.84	\$ 135.84	\$ 138.24	21	10	\$142.61	0.0543%	\$ 2.40	\$ 10.00
19-Jan-25	18-Feb-25	11-Mar-25	31	64	\$ 138.24	\$ 128.24	\$ 128.24	\$ 130.52	21	10	\$135.01	0.0545%	\$ 2.28	\$ 10.00
19-Feb-25	18-Mar-25	8-Apr-25	28	65	\$ 130.52	\$ 120.52	\$ 120.52	\$ 122.47	21	7	\$128.02	0.0545%	\$ 1.95	\$ 10.00
19-Mar-25	18-Apr-25	9-May-25	31	66	\$ 122.47	\$ 112.47	\$ 112.47	\$ 114.49	21	10	\$119.25	0.0545%	\$ 2.01	\$ 10.00
19-Apr-25	18-May-25	8-Jun-25	30	67	\$ 114.49	\$ 104.49	\$ 104.49	\$ 106.31	21	9	\$111.49	0.0545%	\$ 1.82	\$ 10.00
19-May-25	18-Jun-25	9-Jul-25	31	68	\$ 106.31	\$ 96.31	\$ 96.31	\$ 98.05	21	10	\$103.09	0.0545%	\$ 1.74	\$ 10.00
19-Jun-25	18-Jul-25	8-Aug-25	30	69	\$ 98.05	\$ 88.05	\$ 88.05	\$ 89.61	21	9	\$ 95.05	0.0545%	\$ 1.55	\$ 10.00
19-Jul-25	18-Aug-25	8-Sep-25	31	70	\$ 89.61	\$ 79.61	\$ 79.61	\$ 81.07	21	10	\$ 86.38	0.0545%	\$ 1.46	\$ 10.00
19-Aug-25	18-Sep-25	9-Oct-25	31	71	\$ 81.07	\$ 71.07	\$ 71.07	\$ 72.38	21	10	\$ 77.84	0.0545%	\$ 1.31	\$ 10.00
19-Sep-25	18-Oct-25	8-Nov-25	30	72	\$ 72.38	\$ 62.38	\$ 62.38	\$ 63.52	21	9	\$ 69.38	0.0545%	\$ 1.13	\$ 10.00
19-Oct-25	18-Nov-25	9-Dec-25	31	73	\$ 63.52	\$ 53.52	\$ 53.52	\$ 54.53	21	10	\$ 60.29	0.0545%	\$ 1.02	\$ 10.00
19-Nov-25	18-Dec-25	8-Jan-26	30	74	\$ 54.53	\$ 44.53	\$ 44.53	\$ 45.38	21	9	\$ 51.53	0.0545%	\$ 0.84	\$ 10.00
19-Dec-25	18-Jan-26	8-Feb-26	31	75	\$ 45.38	\$ 35.38	\$ 35.38	\$ 36.09	21	10	\$ 42.15	0.0545%	\$ 0.71	\$ 10.00
19-Jan-26	18-Feb-26	11-Mar-26	31	76	\$ 36.09	\$ 26.09	\$ 26.09	\$ 26.64	21	10	\$ 32.86	0.0545%	\$ 0.56	\$ 10.00
19-Feb-26	18-Mar-26	8-Apr-26	28	77	\$ 26.64	\$ 16.64	\$ 16.64	\$ 17.01	21	7	\$ 24.14	0.0545%	\$ 0.37	\$ 10.00
19-Mar-26	18-Apr-26	9-May-26	31	78	\$ 17.01	\$ 7.01	\$ 7.01	\$ 7.25	21	10	\$ 13.79	0.0545%	\$ 0.23	\$ 10.00
19-Apr-26	18-May-26	8-Jun-26	30	79	\$ 7.25	\$ (2.75)	\$ (2.75)	\$ (2.69)	21	9	\$ 4.25	0.0545%	\$ 0.07	\$ -

Solutions - Credit Cards



Additional 'talking points' are highlighted in green for your convenience.

Case Study 1: Katie

Solution 1

- i) \$1,204.93 is March statement balance
- ii) Yes. Katie paid \$1,204.93 on 12 April (Item 4 on the statement). The payment is also acknowledged in "Payment & credit" summary. There are no "Past due" items shown on March statement
- iii) \$1,615.55 is April statement balance
- iv) 13 May is the payment due date for the April statement
- v) Her April min payment is \$49.00.
- vi) 19.89% is the stated annual rate for non-cash purchases. The rate can increase to 25.99% when the card holder fails to make minimum payments twice in a 12 months period. **These details are described in credit holder agreement.**
- vii) **This is caused by the compounding effect - when the credit card balance is not paid in full by the payment due date, interest charges will apply. Interest charges are added to the outstanding balance. The subsequent statement calculates interest charges on the outstanding balance that is augmented by the previously incurred interest charges. Thus, interest is calculated on top of interest, i.e. interest is compounded. The compounding process continues until the entire balance including all accrued interest charges are paid off.**
- viii) 21.49% is annual stated rate for cash advances.
- ix) **The interest-free grace period means that interest will not be charged on purchases and fees if Katie pays the full outstanding balance by the payment due date shown on her statement. There is no interest-free grace period for cash advances (including balance transfers, cash-like transactions and transactions using convenience checks) and their associated fees.**
- x) 21 days is the minimum interest free grace period, i.e. the number of days from 22 April to 13 May. **Note that the payment due date, 13 May, is included in the grace period calculations despite the fact, that the payment must be made on that day.**
- xi) Interest-free grace period for each transaction ('txn'):
 - a. #1: 51 days (from txn date of 23 March to 13 May)
 - b. #2: 44 days (from txn date of 30 March to 13 May)
 - c. #3: 36 days (from txn date of 7 April to 13 May)
 - d. #5: 21 days (from txn date of 22 April to 13 May)

Solution 2

The "Total new balance" on the May statement, i.e. for the period from 23 April to 22 May, will be \$0 if Katie's payment of \$1,615.55 reaches the credit card company by the end of day of 13 May.

Solution 3A

- i) **No, Katie is not eligible for the interest-free grace period because she failed to pay the full outstanding balance by the payment due date shown on her statement.**
- ii) Yes, the interest rate charges will be calculated for each day of the April period, i.e. from 23 March - 22 April, and show in the May statement.
- iii) Interest rate charges shown on May statement are calculated up to the last day of the April statement, i.e. 22 April inclusive.
- iv) Interest rate charges for the April period will be posted to Katie's account on the last day of the April period.

- v) The April interest charges will start accumulating interest (interest-on-interest) from the day of posting, i.e. no grace period, throughout all May period.
- vi) The payment date on May statement is 21 days after the last day of May period, i.e. 12 June.

Solution 3B

- i) During the April period (23 Mar to 22 Apr), between the dates shown in the table the balances will not change.

From (inclusive)	To (exclusive)	Days	Balance	Calculations
23-Mar	30-Mar	7	\$ 999.00	\$999.00
30-Mar	7-Apr	8	\$ 1,038.99	\$999.00 + \$562.57
7-Apr	22-Apr	15	\$ 1,601.56	\$1,038.99 + \$39.99
22-Apr	23-Apr	1	\$ 1,615.55	\$1,601.56 + \$13.99

- ii) There are 31 calendar days in the April period from 23 April to 22 May (as shown in the table above).
- iii) \$1,455.63 is the average daily credit card balance in the period calculated as follows: $(7*999 + 8*1038.99 + 15*1601.56 + 1615.55) / 31$
- iv) The daily interest rate is 0.0543%, calculated as $19.89\% / 366$, as 2020 is a leap year. **Some credit card companies my use 365 days or 360 days when converting annual interest rate to a daily interest rate.**
- v) Interest charge for the April period equals $\$24.52 = 31 * \$1,456.63 * 0.0543\%$

Solution 4A

- i) She still has more interest to pay because there was an outstanding credit card balance throughout May period. **This residual interest, also known as ‘trailing interest’, is the interest charged on a credit card balance that accumulates between the billing statement date and the date you pay the bill. Residual interest only applies if you carry a balance on a credit card from month to month.**
- ii) No, Katie is not eligible for any interest-free grace period as she still has outstanding interest charges to pay. **Should she make any purchases on her credit card, the interest on those ne transactions will start accumulating from the transaction day.**
- iii) May period interest charges shown in the June statement are calculated up to the last day in the May period, i.e. 22 May.
- iv) The interest rate charges for the May period will be posted to Katie’s account on the last day of the May period.
- v) The May interest charges will start accumulating interest (interest-on-interest) from the day of posting, i.e. no grace period, throughout all of the June period
 - a. The payment date on the June statement is 21 days after the last day of the June period, i.e. 13 July.

Solution 4B

- i) The May period, i.e. from 23 April to 22 May

From (inclusive)	To (exclusive)	Days	Balance	Calculations	Notes
23-April	15-May	22	\$1,640.07	\$1,615.55 + \$24.52	April interest added to balance
15-May	23-May	8	\$24.52	\$1,640.07 - \$1,615.55	April balance paid in full

- ii) There are 30 days in May period, i.e. $22 + 8 = 30$

- iii) $\$1,209.26$ is the average daily credit card balance in the period calculated as follows: $(22 * \$1,640.07 + 8 * \$24.52) / (22 + 8)$
- iv) Daily interest rate is 0.0543%, calculated as $19.89\% / 366$, as 2020 is a leap year.
- v) Interest charge for May period equals $\$19.71 = 30 * \$1,209.26 * 0.0543\%$

Solution 5

Katie's July statement will still show a small interest charge for the June period, **unless the credit card company ignores the charges as they are below one dollar (this would be mentioned in a really fine print in the Cardholder Agreement, if at all). If not ignored, it would prevent Katie to benefit from the interest-free grace period for yet another month.**

Here are our calculations, following the pattern in earlier questions.

- i) Outstanding balance on each day of the June period, i.e. from 23 May to 22 June

From (inclusive)	To (exclusive)	Days	Balance	Calculations	Notes
23-May	13-June	21	\$44.23	$\$24.52 + \19.71	May interest added to balance
13-June	23-June	10	\$19.71	$\$44.23 - \24.52	May balance paid in full

- ii) There are 31 days in the June period, i.e. $21 + 10 = 31$
- iii) $\$36.33$ is the average daily credit card balance in the period calculated as follows: $(21 * \$44.23 + 10 * \$19.71) / (21 + 10)$
- iv) Daily interest rate is 0.0543%, calculated as $19.89\% / 366$, as 2020 is a leap year.
- v) Interest charge for the June period equals $\$0.61 = 31 * \$36.33 * 0.0543\%$

If the credit card company decides not to ignore the interest charge from the July statement, Katie's August statement will still show a small interest charge for the July period, again less than a dollar. Here are our calculations:

- i) Calculate the outstanding credit card balance on each day of the July period, i.e. from 23 June to 22 July

From (inclusive)	To (exclusive)	Days	Balance	Calculations	Notes
23-June	13-August	21	\$20.32	$\$19.71 + \0.61	June interest added to balance
13-August	23-July	9	\$0.61	$\$20.32 - \19.71	June balance paid in full

- ii) There are 31 days in the July period, i.e. $21 + 9 = 30$
- iii) $\$14.41$ is the average daily credit card balance in the period calculated as follows: $(21 * \$20.32 + 9 * \$0.61) / (21 + 9)$
- iv) Daily interest rate is 0.0543%, calculated as $19.89\% / 366$, as 2020 is a leap year.
- v) Interest charge for the July period equals $\$0.23 = 30 * \$14.41 * 0.0543\%$

Katie's September statements will finally clear the residual interest - only when we assume that she is still forced to make a minimum payment of \$10.

i) Balance on each day of the August period, i.e. from 23 July to 22 August

From (inclusive)	To (exclusive)	Days	Balance	Calculations	Notes
23-July	13-August	21	\$0.84	$\$0.61 + \0.23	July interest added to balance
13-August	23-August	10	(\$9.16)	$\$0.84 - \10.00	July minimum payment of \$10.0

ii) The negative balance indicates an over-payment, i.e. the credit company owes Katie money (though it does not pay any interest to the cardholder). That overpayment will be used to reduce future payments, assuming Katie makes new transactions.

Solution 6

- i) \$45.07 ($\$24.52 + \$19.71 + \$0.61 + \0.23) is the total interest amount Katie would pay for being one day late with her payment of \$1,615.55, i.e. one day delay would cost Katie 2.79% of the owed amount. For comparison, high yield savings account as of the date of this document offer annual rates around 1.4% per year. Thus, a “late fee” for one day is comparable with two years of interest from a high yield savings account.
- ii) She could have contacted the credit card provider and requested a full payoff instead of paying the balance shown on the statement. Alternatively, she could have estimated the interest charges that would be shown on the next statement (to be certain, overshooting a bit) and made a payment as soon as possible rather than waiting for the payment due date.
- iii) She would not be eligible for the interest-free grace period on new transactions.
- iv) Different payment methods result in different numbers of days to process. Mailing a check is the least reliable method to have the payment arrive by the payment due date (for example, mail is not delivered on the week-end but payment date can fall on the week-end). Manual bill payment from the bank account to the credit card company does not happen instantaneously. It may take one to two business days depending on the bank, credit card company, and the time the transaction was entered. An automatic payment from the bank account initiated by a credit card company guarantees the payment on the payment date, assuming there are enough funds in Katie’s bank account.
- v) She should contact the credit card provider to set up automatic payments of the full balance from her chequing account to ensure she never misses a monthly credit card payment. She needs to monitor her spending on the credit card and make sure that ahead of the payment date she has enough funds in her account (to avoid a bounced payment) - and she should have overdraft protection on her chequing account.
- When you go over your monthly credit card limit your bank will charge you an over-limit fee. She should also check with her bank to see if they offer an ‘over-limit pad’. This will block any purchase she makes that takes her over her credit card limit - avoiding the fee (and applicable interest). These features are discussed on the Chequing Account pages of the FinStart website.

Case Study 2: Samir

Solution 7

- i. \$210.95 was the balance in the September statement for the period 19 August - 18 September 2019.
- ii. Yes, the September statement balance was paid in full and on time as one can tell by examining the following:
 - a. Amount of -\$210.95 in “Payments & credits” section offsets \$210.95 in the “Previous balance” section.
 - b. Amount of \$0 in “Past due” section.
 - c. Amount of -\$210.95 for the transaction “Payment Received” posted on 9 October, 2020, the payment due date.
- iii) \$515.00 is the balance in the October statement for the period 19 September - 18 October 2019.
- iv) 8 November 2019 is the payment due date shown in the October statement.
- v) 18 September is the transaction date (the date purchase took place) associated with the laptop purchase at Best Buy. 19 September is the posting date (the date the credit card account was charged). The posting date can be between 0 to 2 days after the transaction day as it depends on merchant interaction with credit card provider.
- vi) The posting date determines whether the laptop purchase is included in October statement. Interest rate calculations are based on the posting date.
- vii) 51 days. The interest-free free grace period starts from the posting date of 19 September and ends on the payment due date of 8 November 2019, inclusive. Thus, there are 12 days in the month of September, 31 days in the month of October and 8 days in the month of November, i.e. 51 days in total.
- viii) Yes, Miguel is eligible for the interest-free grace period because he paid the full outstanding balance in the September statement by the payment due date.
- ix) \$16.00 is the minimum payment that Miguel has to make by the due date.
- x) The minimum payment is the bigger of \$10.00 and 3% of the statement balance of \$515.00, rounded up to the nearest dollar. It is up to individual credit card providers to decide how to round the minimum balance. The minimum balance is also augmented by any additional fees, for example \$20.00 penalty for exceeding one’s credit card limit, or NSF (Non-Sufficient-Funds) fee (such as \$20.00 for a declined cheque). Note that in the case of NFS the bank that declined the cheque will also charge the account holder a penalty that can be as high as \$50.00. If the outstanding balance is less than \$10.00, the minimum payment will be set to the full outstanding balance.
- xi) No, Miguel will not incur any interest charges if he pays his full balance of \$515.00 by 8 November 2019. In this situation Miguel borrowed \$515.00 at \$0 cost.
- xii) No, Miguel will not be eligible for the interest-free grace period if he makes minimum payment of \$16.00 by 8 November 2019 because he did not pay the full balance.
- xiii) Yes, Miguel will incur interest charges if he only makes the minimum payment of \$16.00 by 8 November 2019. The credit card provider will charge interest from the posted date.
- xiv) 19.89% is the stated annual interest rate on the credit card for non-cash purchases. However, the credit card provider can increase that interest rate (as per the card holder agreement) to a higher rate of 25.99% if Miguel fails to make two minimum payments in a twelve-month period.
- xv) 0.0545% (i.e. $19.89\% / 365$) and 0.0543% (i.e. $19.89\% / 366$) is the daily interest Miguel will be charged in a non-leap and leap year, respectively. The daily interest rate calculations are described in the cardholder agreement and can vary among credit card providers.
- xvi) Should Miguel make the minimum payment only on 8 November, the amount of interest charges shown on the November statement can be calculated using the daily balance method as follows:
 - a. \$515.00 is the average daily balance in the October period as Miguel had only one transaction that was posted on the first day of the period, 19 September.
 - b. 30 is the number of days in the October period from 19 September to 18 October, i.e. 12 days in the month of September and 18 days in the month of October.
 - c. 0.0545% (i.e. $19.89\% / 365$) is the daily interest rate that is applied to the average daily balance.
 - d. \$8.42 is the interest charges for the October period, i.e. $\$515.00 * 30 * 0.0545\%$.

- xvii) \$523.42 (i.e. $\$515.00 + \8.42) is the “Total new balance” on the November statement that covers the period from 19 October to 18 November. The balance is the sum of \$515.00 (the balance on the last day of the October period) plus \$8.42 (interest charges for the October period).
- xviii) What will the minimum payment be on the November statement?
- $\$15.71 = \$523.42 * 3\%$ (3% of \$523.42 - the November statement balance).
 - \$16 is the result of rounding up \$15.71 to the nearest dollar.
 - \$16 is the minimum payment as it is higher than \$10.00, and there are no other fees to add to the minimum payment.
 - The minimum payment of \$16.00 is higher than the calculated interest charge of \$8.42 to enable repayment of \$7.58 of the loan principal. If the minimum payment was less or equal to the interest charge the loan would never be repaid.
- xix) 9 December 2019 will be the payment due date on the November statement, i.e. 21 days after 18 November, the last day of November period (12 days in the month of November and 9 days in the month of December, together $21 = 12 + 9$).
- xx) Should Miguel continue making minimum payments only, interest charges on the December statement (i.e. the charges incurred in the November period) can be calculated using the average daily balance method as follows:
- Average daily balance calculations for the November period:
 - \$523.42 (i.e. $\$515.00 + \8.42) is the balance on the first day of the November period. It consists of the outstanding balance of \$515.00 on the last day of the October period, plus \$8.42 of October interest charges (as the interest-free grace period does not apply), plus \$0 for any transactions posted on the first day of November period.
 - \$523.42 balance was outstanding for 21 days from 18 October to 8 November (i.e. until the payment due date).
 - \$507.42 (i.e. $\$523.42 - \16.00) was the balance on the day after the payment due date as \$16.00 minimum payment was made on the payment due date.
 - \$507.42 balance was outstanding for 10 days from 9 November (one day after the payment due date) to 18 November (i.e. the last day in the November period).
 - \$518.26 is the average daily balance for the November period, i.e. $(\$523.42 * 21 + \$507.42 * 10) / (21 + 10)$.
 - There are 31 days in the November period.
 - 0.0545% (i.e. $19.89\% / 365$) is the daily interest rate that is applied to the average daily balance.
 - \$8.75 is the interest charge for the November period, i.e. $\$518.26 * 31 * 0.0545\%$.
- xxi) $\$516.47 = \$507.42 + \$8.75$ will be the “Total new balance” on the December statement that covers the period from 19 November to 18 December. The balance is the sum of \$507.42 (the balance on the last day of the November period) plus \$8.75 (interest charges for the November) period.
- xxii) \$16.00 will be the minimum payment date on the December statement, i.e. 3% of \$516.47 rounded up to the nearest dollar.
- xxiii) 8 January 2020 will be the payment due date on the December statement, i.e. 21 days after 18 December, the last day of the December period (13 days in the month of December and 8 days in the month of January, together $21 = 13 + 8$).
- xxiv) The attached summary of future monthly statements associated with the minimum payment strategy shows that:
- 9 May 2026 will be the last payment that completes the repayment of Miguel’s credit card debt. Thus, it will take 78 months, i.e. 6 years and 6 months, to repay the debt using the minimum payment strategy.
 - \$886.25 would be the sum of all Miguel’s payments.
 - $\$371.25 = \$886.25 - \$515.00$ would be the total interest charge Miguel would pay.
- xxv) The estimated number of monthly payments and total interest charges would:
- Increase if the stated annual interest increased.
 - Increase slightly if the credit card provider did not round the minimum payment up to the nearest dollar.

- c. Increase if Miguel missed two minimum payments within a year because the outstanding balance would be larger (due to missed payments) and the credit card provider would increase the interest rate charged to 25.99% from 19.89%.
 - d. No impact as Miguel is not eligible for the interest-free grace period until the balance is paid in full.
- xxvi) The following strategies would help Miguel accelerate the repayment of his credit card debt and reduce overall interest charges because of:
- a. Lower interest on a personal unsecured loan, assuming he fully pays his credit card balance.
 - b. Lower promotional interest on the new transfer credit card. Miguel should try to repay the entire loan during that period.
 - c. Faster loan principal (the amount he borrowed) repayment and thus lower interest charges if Miguel increased monthly payment by \$10.00 on top of the minimum payment.
 - d. Faster principal repayment and thus lower interest charges if Miguel made credit card payments as soon as he has cash available, prior to the payment due dates.

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