Chapter 6 — Financial Services Review

1. For a fee of $8.00 per month, Sally is allowed an unlimited number of deposits and 6 self-service (bank card, atm) withdrawal transactions on her bank account. Each additional self-service transaction costs $0.50. Each full-service transaction (teller assisted) costs $1.50.

   a) Calculate Sally's balance after each transaction.

   
<table>
<thead>
<tr>
<th>Transaction</th>
<th>Description</th>
<th>Withdrawal</th>
<th>Deposit</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM 1</td>
<td>Cash</td>
<td>$200.00</td>
<td></td>
<td>$2879.54</td>
</tr>
<tr>
<td>Direct deposit 2</td>
<td>Paycheque</td>
<td></td>
<td>$457.21</td>
<td>3136.75</td>
</tr>
<tr>
<td>Bank card 3</td>
<td>Groceries</td>
<td>$172.12</td>
<td></td>
<td>2964.63</td>
</tr>
<tr>
<td>Bank card 4</td>
<td>Gas</td>
<td>$42.54</td>
<td></td>
<td>2922.09</td>
</tr>
<tr>
<td>ATM 5</td>
<td>Cheque–reimbursement</td>
<td></td>
<td>$175.64</td>
<td>3097.73</td>
</tr>
<tr>
<td>Bank card 6</td>
<td>Dinner</td>
<td>$32.42</td>
<td></td>
<td>3065.31</td>
</tr>
<tr>
<td>ATM 1</td>
<td>Cash</td>
<td>$100.00</td>
<td></td>
<td>2965.31</td>
</tr>
<tr>
<td>Auto-withdrawal 2</td>
<td>Hydro</td>
<td></td>
<td>$112.21</td>
<td>2853.10</td>
</tr>
<tr>
<td>Direct deposit 3</td>
<td>Paycheque</td>
<td></td>
<td>$457.21</td>
<td>3310.31</td>
</tr>
<tr>
<td>Auto-withdrawal 4</td>
<td>Rent</td>
<td></td>
<td>$645.00</td>
<td>2665.31</td>
</tr>
<tr>
<td>Bank card 5</td>
<td>Car repairs</td>
<td>$276.97</td>
<td></td>
<td>2388.34</td>
</tr>
<tr>
<td>Bank card 6</td>
<td>Movie</td>
<td>$28.12</td>
<td></td>
<td>2360.22</td>
</tr>
<tr>
<td>ATM 7</td>
<td>Cash</td>
<td>$200.00</td>
<td></td>
<td>2160.22</td>
</tr>
</tbody>
</table>

   b) Calculate the service charges added to Sally's account at the end of the month.

   \[ 8.00 + (7 \times 0.50) = \$11.50 \]

   + Check fine print on p 256 of your text.
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2. You deposit $2000 in the bank. The annual interest rate is 3%. You leave your money in the bank for 3 years.
   
a) Calculate the simple interest earned at the end of 3 years.

\[
I = Prt = 2000 \times 0.03 \times 3 = \$180
\]

b) Calculate the total amount in your bank account at the end of 3 years.

\[
2000 + 180 = \$2180
\]

3. You invest $12,000 in the bank at an annual interest rate of 2.5%. You leave the money in the bank for 9 months.

a) Calculate the simple interest earned at the end of 9 months.

\[
I = Prt = 12000 \times 0.025 \times \left( \frac{9}{12} \right) \\
= \$225
\]

b) Calculate the total amount in your bank account at the end of 9 months.

\[
12000 + 225 = \$12225
\]
4. Your next door neighbor is in grade 5. He wants to know why he should put his summer job earnings of $200 in the bank. Explain what the bank will do for him. Use the word interest in your example. For full marks, use 2% in your answer as well as a calculation.

After a year, 2% interest means the bank adds $4 to your account. You will have $204!

5. You are given the formula \( I = Prt \). However, sometimes you want to find something other than \( I \). Write out the formulas for \( P, r, \) and \( t \).

\[
P = \frac{I}{rt}
\]

\[
r = \frac{I}{P} \times 100
\]

\[
t = \frac{I}{Pr}
\]

6. How long would it take to double $9,000,000,000,000,000 if the interest rate was 3%?

\[
\frac{72}{3} = 24 \text{ years}
\]
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7. Calculate the time required to earn the following amounts of interest:

a) $210 in interest from $1,000 invested at 3%.

\[
t = \frac{I}{Pr} = \frac{210}{(1000 \times 0.03)} = 7 \text{ yrs}
\]

b) $112.50 in interest on $2,000 invested at 2.25%.

\[
\frac{112.50}{(2000 \times 0.0225)} = 2.5 \text{ yrs}
\]

8. John wants to earn $7,000 interest so he can buy his fiancée an engagement ring. His local bank offers him 2.75% interest. He plans to propose in 3 years. How much money (principal) does he need to invest to earn this amount of interest?

\[
I = 7000 \\
\frac{I}{r} = \frac{7000}{0.0275 \times 3} \\
P = \frac{7000}{1.08275} = \$84848.48
\]
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9. Martha has sent $3,000 to a friend in Pakistan. She wants her to invest it for her. Calculate the interest rate of Martha’s investment if she earns $2,100 of simple interest in 5 years.

\[
\begin{align*}
\frac{I}{P} & = \frac{2100}{3000 \times 5} \\
& = \frac{2100}{15000} \\
& = 14\% 
\end{align*}
\]

10. Explain what is meant by “compounding” when you are putting your money into a savings account.

Calculating and adding interest makes your principal grow faster.

11. How many times a year is an investment compounded if it is compounded:

a) monthly 12
b) semi-annually 2
c) daily 365
d) weekly 52
e) quarterly 4
12. Bob invested $8,000 in a bank offering an interest rate of 2.35%, compounded annually. How much money will he have in his account at the end of 2 years?

\[ A = 8000 \left(1 + \frac{0.0235}{1}\right)^2 \]

\[ = 8380.42 \]

13. Rob invested $8,000 in a bank offering an interest rate of 2.35%, compounded monthly. How much money will he have in his account at the end of 2 years? Show your calculations.

\[ A = 8000 \left(1 + \frac{0.0235}{12}\right)^{24} \]

\[ = 8384.59 \]

14. Fill out the table to show you understand the various credit options available.

<table>
<thead>
<tr>
<th>Credit Option</th>
<th>Interest Rate</th>
<th>Compounds per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan from the credit union or a bank</td>
<td>4.95%</td>
<td>12</td>
</tr>
<tr>
<td>Credit Card like MasterCard or Visa</td>
<td>19.99%</td>
<td>365</td>
</tr>
<tr>
<td>MoneyMart</td>
<td>50%</td>
<td>added every 2 weeks</td>
</tr>
<tr>
<td>Gramma</td>
<td>0%</td>
<td>None!</td>
</tr>
</tbody>
</table>
15. You want to purchase a car for $13,000 including all taxes and fees.

a) Calculate the monthly loan payment for a $13,000 loan. The annual interest rate is 5%, the term is 3 years.

\[
\frac{13000}{1000} \times 29.97 = \$ 389.61
\]

b) Calculate the total amount paid back to the bank.

\[
389.61 \times 3 \times 12 = \$ 14025.96
\]

a) How much interest did you pay on your loan?

\[
14025.96 - 13000 = \$ 1025.96
\]

b) How much interest was there in your first monthly payment?

\[
13000 \times 0.05 \times \left( \frac{1}{12} \right) = \$ 54.17
\]
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16. Give one (1) advantage and one (1) disadvantage for extending the term of your loan from 3 years to 7 years.

Adv: Lower monthly payment
Disadv: Pay more interest

17. What does GIC stand for? List an advantage and disadvantage of a GIC.

Guaranteed Investment Certificate
Adv: Higher interest rate than savings
Disadv: "Locked in" for the entire term

18. What is a term deposit?

A GIC!

19. Payday Loan companies say they don't charge interest. Briefly explain how they work.

Charge a fee per $100 borrowed.
Ex.: $20 per $100.
Must pay back $120 in 2 weeks (payday).
Works out to a lot of interest.

\[ r = \frac{\frac{I}{P} \times 100}{(100 \times \frac{2}{52})} = \frac{20}{(100 \times \frac{2}{52})} \times 100 = 520\% \]