2 Getting Started

When a Loan Is an Investment

Doris works as a personal loan manager at a bank. It is her job to decide whether the bank should lend money to a customer. When she approves a loan, she thinks of it as the bank making an investment in the person who is borrowing the money. Doris is considering a loan application from Leandro, who wants to borrow \$10 000 to renovate his garage so that he can use it as a workshop. She expects the money borrowed plus interest to be repaid as a single payment at the end of 2 years. She is considering the following three loan options for Leandro:

Option A: A loan at 6% simple interest

Option B: A loan at 5.5% compound interest with annual compounding

Option C: A loan at 5% compound interest with semi-annual compounding

? Which option is most beneficial for the bank, and which is most beneficial for Leandro?

A. Why do you think Doris considers a bank loan as an investment?

B. Identify the following for the three loan options:

- **i)** The principal
- **ii)** The term
- **iii)** The type of interest, the interest rate, and the compounding frequency

C. Why is it difficult to predict which option is most beneficial to the bank or to Leandro?

D. For option A, how much would Leandro need to repay at the end of the term? How much of this amount is interest?

E. For option B, how much would Leandro need to repay? How much of this amount is interest?

F. For option C, how much would Leandro need to repay? How much of this amount is interest?

G. Which of the three options is most beneficial for the bank? Which is most beneficial for Leandro? Explain.

H. Consider a fourth loan option:

Option D: A loan at 5% interest, compounded semi-annually, with payments of \$2658.18 at the end of every 6-month period for 2 years

i) Complete the following table to show the repayment of the loan.

Payment Period	Payment (\$)	Interest Paid (\$) $\left[\text{Balance} \cdot \left(\frac{0.05}{2}\right)\right]$	Principal Paid (\$) [Payment − Interest]	Balance (\$) [Balance − Principal Paid]
0				10 000.00
1	2658.18			
2	2658.18			
3	2658.18			
4	2658.18			
Total				

ii) What do you notice about the pattern in the values in each column? What other relationships do you notice in the table?

I. Which of the four options is most beneficial for the bank? Which is most beneficial for Leandro? Explain.

WHAT DO You Think?

Decide whether you agree or disagree with each statement. Explain your decision.

1. When the interest rate on a loan increases, the total interest charged also increases.
2. Early in the term of a loan with regular payments, most of each payment goes toward paying off the interest charged. The rest goes toward paying off the principal. Later in the term, most of each payment goes toward paying off the principal.
3. The loan or credit option that results in the least interest charged is the best choice for the borrower.
4. It is better to pay cash to purchase an item than to use credit.
5. It is better to buy than to rent.