

## Section 8.4 Effects of Changing the Conditions of an Ordinary Simple Annuity

1. Determine the monthly payment on \$5000 borrowed at 9% annual interest, compounded monthly, for
  - a) 1 year                      b) 2 years
  - c) 5 years                     d) 10 years
2. Calculate the total interest paid for each loan period in question 1.
3. Use a TVM Solver to determine the number of months (rounded up to the nearest month) required to pay back a \$40 000 loan, borrowed at 6% per year, compounded monthly, given monthly payments of
  - a) \$300                        b) \$600
  - c) \$900                       d) \$1200
4. Determine the monthly payment on a \$16 900 loan for 5 years, when interest is compounded monthly at an annual interest rate of
  - a) 6.0%                        b) 7.2%
  - c) 8.4%                        d) 9.6%
5. Calculate the total interest paid for each part of question 4.
6. Laisha is in grade 11 and plans to start saving money for college. She can save \$250 per month from her part-time job. She is comparing two savings plans from competing banks.

**Plan 1:** 3.7% annual interest, compounded monthly, with monthly deposits of \$250

**Plan 2:** 4.2% annual interest, compounded quarterly, with quarterly deposits of \$750

  - a) Laisha will graduate in 2 years. Which option should she choose in order to save the most money for college?
  - b) How much more interest will Laisha earn with the better plan?
7. a) Compare the amounts at age 65 that would result from making each monthly contribution to a retirement savings fund that earns 4.1% annual interest, compounded monthly.
  - i) \$500, starting at age 25
  - ii) \$1000, starting at age 45b) What is the total amount deposited in each situation?  
c) How much interest would each investment earn?
8. Kim and Jordan have just purchased a two-bedroom condominium for \$279 000. The mortgage rate is 6.12% per year, compounded semi-annually. Use a TVM Solver to help you.
  - a) Determine the monthly payment based on an amortization of 30 years. Use this monthly payment to determine the total amount Kim and Jordan will pay over the life of the mortgage.
  - b) Change the amortization period to 15 years. Determine the monthly payment and the total amount that will be paid over the life of the mortgage.
  - c) Keep the amortization at 15 years and change the payment frequency to semi-annually. Determine the semi-annual payment and the total amount that will be paid over the life of the mortgage.
  - d) Keep the amortization at 15 years and change the payment frequency to bi-weekly (26 payments per year). Determine the bi-weekly payment and the total amount that will be paid over the life of the mortgage.
  - e) How much would Kim and Jordan save by choosing a 15-year mortgage with bi-weekly payments over a 30-year mortgage with monthly payments?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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9. Jean-Luc began repaying a business loan 2 years ago. He borrowed \$24 000 over 10 years at 8.7% annual interest, compounded monthly.
- a) Determine Jean-Luc's monthly payment.
  - b) Calculate the total amount he has paid so far.
  - c) Determine the amount remaining on his loan.
  - d) How much interest would he save if he decided to repay the loan in full today?
  - e) How much interest would Jean-Luc save if he decided to switch to weekly payments of \$69.13 for the remaining 8 years? Assume that the interest rate would remain at 8.7% but would be compounded weekly.
10. Johann would like to take out a \$7500 personal loan and repay it with monthly payments. His bank offers a 4-year loan at 10.0% annual interest, a 5-year loan at 8% annual interest, and a 6-year loan at 6% annual interest, all compounded monthly. Determine which loan repayment period results in Johann paying the least amount of interest over the life of the loan.