

## Chapter 8 Review

### 8.1 Future Value of an Ordinary Simple Annuity, pages 382-389

1. Consider an annuity with payments of \$1600 invested semi-annually for 4 years at 5.6% per year, compounded semi-annually.
  - a) Draw a time line representing the future value of the annuity.
  - b) Express the future value of the annuity as the sum of a series of compound interest investments.
  - c) Use a TVM Solver to determine the future value of the annuity.
  - d) Use the future value of an annuity formula to calculate the value of the annuity.
2. a) Choose a method to determine the future value of each ordinary annuity.
  - i) \$2000 deposited annually for 8 years at 3.9% per year, compounded annually
  - ii) monthly payments of \$90 at 7.8% per year, compounded monthly for 2 years
  - iii) \$5000 deposited semi-annually for 5 years into a fund that pays 6.5% per year, compounded semi-annually
 b) Check one of your answers using a different method.
4. a) Choose a method to determine the present value of each ordinary simple annuity.
  - i) annual payments of \$6500 at 3.5% per year, compounded annually, for 5 years
  - ii) semi-annual income of \$15 000 for 4 years, at 10.2% per year, compounded semi-annually
  - iii) monthly payments of \$1100, for 2 years at 6.9% per year, compounded monthly
 b) Use a TVM Solver to check your answers to part a).

### 8.3 Payments and Total Interest, pages 397-404

5. Determine the value of PV,  $i$ , and  $n$  in each situation.
  - a) \$8000 is to be repaid quarterly for 2 years with interest at 9% per year, compounded quarterly
  - b) a \$17 500 car loan at 6.75% per year, compounded monthly, is to be repaid with monthly payments for 5 years
6. Substitute the values for PV,  $i$ , and  $n$  from each loan in question 5 into the formula
 
$$PMT = PV \left[ \frac{i}{1 - (1 + i)^{-n}} \right]$$
 to solve for the payment.
7. Calculate the total interest paid for each loan in question 5.
8. a) Determine the monthly investment needed to generate \$21 000 in 5 years if interest is earned at 4.2% per year, compounded monthly.
  - b) How much of the \$21 000 is from
    - i) monthly investments into the account?
    - ii) interest?

### 8.2 Present Value of an Ordinary Simple Annuity, pages 390-396

3. \$990 is paid monthly for 1 year at 5.4% annual interest, compounded monthly.
  - a) Draw a time line representing the present value of the ordinary annuity.
  - b) Express the present value of the annuity as the sum of a series of individual present value calculations.
  - c) Use a TVM Solver to determine the present value of the annuity.
  - d) Use the relevant formula to calculate the present value of the annuity.

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**BLM 8–9**  
(page 2)

**8.4 Effects of Changing the Conditions of an Ordinary Simple Annuity, pages 405–411**

- 9. a)** Determine the monthly payment on \$10 000 borrowed at 9.75% annual interest, compounded monthly, for  
**i)** 5 years      **ii)** 10 years  
**b)** Calculate the total interest paid for each loan period in part a).
- 10. a)** Compare the amounts at age 18 that would result from making each monthly contribution to an RESP (Registered Education Savings Plan) that earns 6% annual interest, compounded monthly.  
**i)** \$300, starting at age 14  
**ii)** \$150, starting at age 10  
**iii)** \$100, starting at age 6  
**iv)** \$75, starting at age 2  
**b)** What is the total of the deposits in each situation?  
**c)** How much did each investment earn?
- 11.** Marie purchased a new SUV 3 years ago. She borrowed \$39 000 over 5 years at 8.4% interest, compounded monthly.  
**a)** Determine Marie's monthly payment.  
**b)** Calculate the total amount she has paid so far.  
**c)** Marie wants to pay off the loan in full today. Determine the amount remaining on the loan.  
**d)** How much interest will Marie save by paying off her debt today?