

## Section 8.2 Present Value of an Ordinary Simple Annuity

1. Draw a time line representing the present value of each ordinary simple annuity.
  - i) \$2500 paid annually for 5 years at 5% per year, compounded annually
  - ii) \$1000 payments every 6 months for 5 years at 9.7% annual interest, compounded semi-annually
  - iii) 12 monthly payments of \$800 at 22.2% per year, compounded monthly
  - iv) quarterly payments of \$1250 for 2 years at 12.5% annual interest, compounded quarterly
2.
  - a) Express the present value of each annuity in question 1 as the sum of a series of individual present value calculations.
  - b) Calculate the present value of each series of payments.
3.
  - a) Determine the values of the variables PMT,  $i$ , and  $n$  for each annuity in question 1.
  - b) Use the present value of an annuity formula to calculate the present value of each annuity in question 1.
4.
  - a) Choose a method to determine the present value of each ordinary simple annuity.
    - i) monthly payments of \$850 at 7.5%, compounded monthly for one year
    - ii) annual income of \$16 000 for 10 years, generated by a fund that earns 9.99% interest, compounded annually
    - iii) payments of \$7500 every 6 months, for 4 years at 5.9% interest, compounded semi-annually
  - b) Use a TVM Solver to check your answers to part a).
5. Determine the lump-sum amount needed to generate each income.
  - a) \$50 000 per year for 15 years, assuming interest at 5.9% per year, compounded annually
  - b) \$6000 per month for 20 years, assuming interest at 4.2% per year, compounded monthly
6. Tegan wants hardwood floors installed in her living room. She can either pay \$128.69 per month for 2 years at 9.6% annual interest, compounded monthly, or pay the total in full.
  - a) Determine the total cost if Tegan chooses the monthly payments.
  - b) Determine the total cost if Tegan pays in full on the day of installation.
  - c) How much total interest will Tegan pay if she chooses the monthly payments?
7. A small labour union wants to start a scholarship fund next year. The scholarship will give \$500 to one eligible high school student for each of the following 25 years. If the labour union can invest money at 8% per year, compounded annually, how much money must it invest today to provide the scholarship fund?

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

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

**BLM 8-5**  
(page 2)

8. Jon has 4 years' worth of payments remaining on a personal loan. He pays \$206 per month.
- a) If Jon's bank charges 8.7% per year, compounded monthly, determine the present value of the remainder of the loan.
  - b) If the bank is willing to accept early payment, how much interest would Jon save by paying back the rest of the loan today?
  - c) Jon decides to continue repaying the loan with monthly payments. How much interest will he save if he decides to pay back the rest of the loan when he has exactly 1 year's worth of payments remaining?
9. a) Nicole has a \$8000 loan payable over 24 months at 8.4% annual interest, compounded monthly. Use the method of your choice to determine the monthly payment due at the end of each month.
- b) What is the total amount that Nicole will repay?