

7

Annuities and Mortgages

Strand

Personal Finance

Student Text Pages

398–443

Suggested Timing

15–20 min

Related Resources

BLM A-4 Presentation Checklist

Key Terms

accelerated bi-weekly payment
accelerated weekly payment
amortization
amortization period
amortization table
annuity
appreciation rate
bi-weekly payment
fixed rate mortgage
mortgage
mortgage term
pre-approved mortgage
semi-monthly payment
weekly payment

Chapter Curriculum Specific Expectations

Understanding Annuities

In this chapter, students will

PF1.01 gather and interpret information about annuities, describe the key features of an annuity, and identify real-world applications (e.g., RRSP, mortgage, RRIF, RESP)

PF1.02 determine, through investigation using technology (e.g., the TVM Solver on a graphing calculator; online tools), the effects of changing the conditions (i.e., the payments, the frequency of the payments, the interest rate, the compounding period) of an ordinary simple annuity (i.e., an annuity in which payments are made at the *end* of each period, and compounding and payment periods are the same) (e.g., long-term savings plans, loans)

PF1.03 solve problems, using technology (e.g., scientific calculator, spreadsheet, graphing calculator), that involve the amount, the present value, and the regular payment of an ordinary simple annuity

PF1.04 demonstrate, through investigation using technology (e.g., a TVM Solver), the advantages of starting deposits earlier when investing in annuities used as long-term savings plans

PF1.05 gather and interpret information about mortgages, describe features associated with mortgages (e.g., mortgages are annuities for which the present value is the amount borrowed to purchase a home; the interest on a mortgage is compounded semi-annually but often paid monthly), and compare different types of mortgages (e.g., open mortgage, closed mortgage, variable-rate mortgage)

PF1.06 read and interpret an amortization table for a mortgage

PF1.07 generate an amortization table for a mortgage, using a variety of tools and strategies (e.g., input data into an online mortgage calculator; determine the payments using the TVM Solver on a graphing calculator and generate the amortization table using a spreadsheet), calculate the total interest paid over the life of a mortgage, and compare the total interest with the original principal of the mortgage

PF1.08 determine, through investigation using technology (e.g., TVM Solver, online tools, financial software), the effects of varying payment periods, regular payments, and interest rates on the length of time needed to pay off a mortgage and on the total interest paid

Teaching Suggestions

Chapter Opener

- Have students discuss the lifestyles of retired people they know.
- Determine students' knowledge of pensions and the costs of independent living.
- Determine students' knowledge of the key terms. Do students have experience with any of these terms?
- Emphasize the practicality of the mathematics involved in this chapter and in Chapter 8.

Career Profile

Have students discuss what they know about a career as an insurance claims adjuster. As an extension, have students research this career and other careers that use annuities and mortgages, and present their findings to the class. You may wish to use **BLM A-4 Presentation Checklist** to assess students' presentations.

Using their research, have students discuss:

- The duties of an insurance claim investigator.
- The type of education and training needed for this career.
- Other careers that use annuities and mortgages.
- The differences in the training and education required for a similar career.

You may wish to have students include their research in their Portfolios.

Chapter 7 Planning Chart

Section Suggested Timing	Student Text Page(s)	Teacher's Resource Blackline Masters	Assessment	Tools
Chapter 7 Opener • 15–20 min	398–399		• BLM A-4 Presentation Checklist	
Prerequisite Skills • 40 min	400–401	• BLM 7-1 Prerequisite Skills	• BLM 7-2 Prerequisite Skills Self-Assessment Checklist	• graphing calculators or computers with graphing software
7.1 Annuities • 80–160 min	402–413	• BLM 7-3 Section 7.1 Annuities	• BLM A-9 Communication General Scoring Rubric	• graphing calculators • computers with Internet access and spreadsheet software <i>Optional</i> • TI-Nspire™ CAS graphing calculators
7.2 The Conditions of an Annuity • 80–160 min	414–419	• BLM 7-4 Section 7.2 The Conditions of an Annuity	• BLM 7-5 Section 7.2 Achievement Check Rubric • BLM A-5 Problem Solving Checklist	• graphing calculators • computers with Internet access
7.3 Mortgages and Amortization • 80–160 min	420–429	• BLM 7-6 Section 7.3 Mortgages and Amortization	• BLM A-17 Learning Skills Checklist	• graphing calculators • computers with Internet access
7.4 The Conditions of a Mortgage • 80–160 min	430–437	• BLM 7-7 Section 7.4 The Conditions of a Mortgage	• BLM 7-8 Section 7.4 Achievement Check Rubric • BLM A-6 Knowledge and Understanding General Scoring Rubric	• graphing calculators • computers with Internet access <i>Optional</i> • newspapers
Chapter 7 Review • 40–80 min	438–439	• BLM 7-9 Chapter 7 Review • BLM 7-10 Chapter 7 Literacy		• graphing calculators
Chapter 7 Practice Test • 40–80 min	440–441		• BLM 7-11 Chapter 7 Practice Test • BLM 7-12 Chapter 7 Test	• graphing calculators
Chapter 7 Problem Wrap-Up • 40 min	441		• BLM 7-13 Chapter 7 Problem Wrap-Up Rubric	• graphing calculators
Chapter 7 Task • 80 min	442–443		• BLM 7-14 Chapter 7 Task Rubric	• graphing calculators • computers with Internet access

Chapter 7 Blackline Masters Checklist

	Title	Purpose
Chapter 7 Opener		
	BLM A-4	Presentation Checklist Assessment
Prerequisite Skills		
	BLM 7-1	Prerequisite Skills Practice
	BLM 7-2	Prerequisite Skills Self-Assessment Checklist Self-Assessment
7.1 Annuities		
	BLM 7-3	Section 7.1 Annuities Practice
	BLM A-9	Communication General Scoring Rubric Assessment
7.2 The Conditions of an Annuity		
	BLM 7-4	Section 7.2 The Conditions of an Annuity Practice
	BLM 7-5	Section 7.2 Achievement Check Rubric Assessment
	BLM A-5	Problem Solving Checklist Assessment
7.3 Mortgages and Amortization		
	BLM 7-6	Section 7.3 Mortgages and Amortization Practice
	BLM A-17	Learning Skills Checklist Assessment
7.4 The Conditions of a Mortgage		
	BLM 7-7	Section 7.4 The Conditions of a Mortgage Practice
	BLM 7-8	Section 7.4 Achievement Check Rubric Assessment
	BLM A-6	Knowledge and Understanding General Scoring Rubric Assessment
Chapter 7 Review		
	BLM 7-9	Chapter 7 Review Review
	BLM 7-10	Chapter 7 Literacy Student Support
Chapter 7 Practice Test		
	BLM 7-11	Chapter 7 Practice Test Diagnostic Assessment
	BLM 7-12	Chapter 7 Test Summative Assessment
Chapter 7 Problem Wrap-Up		
	BLM 7-13	Chapter 7 Problem Wrap-Up Rubric Summative Assessment
Chapter 7 Task		
	BLM 7-14	Chapter 7 Task Rubric Summative Assessment
	BLM 7-15	Chapter 7 BLM Answers

Prerequisite Skills

Student Text Pages

400–401

Suggested Timing

40 min

Tools

- graphing calculators or computers with graphing software

Related Resources

BLM 7-1 Prerequisite Skills
BLM 7-2 Prerequisite Skills
Self-Assessment Checklist

Common Errors

- Some students may make simple calculation errors.
- R_x Have students estimate before calculating so they can determine if their answers are reasonable. For example, **question 9, part a)** asks for the future value of \$1500 at 4% per year, compounded annually, for five years. A reasonable answer would be an amount under \$25 000.
- Some students may need to review the meaning and the use of the compound interest formula.
- R_x Have students review material or texts from grade 11. Have students use a TVM Solver to assist with calculations or to confirm answers. Wherever practical, have students estimate answers before calculating.

Accommodations

Motor—provide students with enlarged copies of the tables for **questions 6 and 11**

Memory—have students write the formulas for present value and future value and explain the meaning of each component in the formulas

Teaching Suggestions

- Students should use mental math skills as much as possible when completing questions **1 to 3 and 5**.
- Questions 6 to 8** review skills from Chapter 6
- Questions 9 and 10** may require some review. This material was covered extensively in grade 11. Refer students to the appropriate sections of *Foundations for College Mathematics 11* if remediation is required.
- Ensure that students complete **questions 11 and 12** since these questions relate directly to the annuities that will be covered in section 7.1.
- All BLMs referred to throughout this chapter can be found on the *Foundations for College Mathematics 12: Teacher's Resource CD ROM*.

Assessment

- Assess students' readiness to proceed by informal observation as students are working on the questions. A formal test is inappropriate since this material is not part of the grade 12 curriculum for this chapter.
- Student self-assessment is also an effective technique; students can place a checkmark beside topics in the Prerequisite Skills in which they feel confident with the necessary skills. Use **BLM 7-2 Prerequisite Skills Self-Assessment Checklist** as a self-assessment tool for students.
- Remedial action can be taken in small groups or with a whole-class skills review.

Extra Practice

- Use **BLM 7-1 Prerequisite Skills** for extra practice or remediation.

Chapter Problem

- The Chapter Problem is introduced on page 401. Have students discuss their understanding of the topic. You may wish to have students complete the Chapter Problem revisits that occur throughout the chapter. These questions are designed to help students move toward the Chapter 7 Problem Wrap-Up on page 441.
- Alternatively, you may wish to assign the Chapter Problem questions and Chapter Problem Wrap-Up when students have completed the chapter, as part of a summative assessment.