
Performance Tasks for Part 1: Financial Applications of Sequences and Series

“Big Ideas” Addressed by the Tasks

The *Performance Tasks* in this section provide opportunities for students to

- use sequences and series to model problem-solving situations
- demonstrate an understanding of the relations between growth, compound interest, and geometric sequences and series
- solve real-world problems involving arithmetic and geometric sequences and series
- solve problems involving compound interest and annuities
- apply knowledge about compound interest and annuities to financial decision making
- demonstrate an understanding of terms and conditions related to Canadian mortgages
- use technology as an aid for investigating patterns and for financial decision making
- communicate mathematics in various forms
- justify their reasoning

Curriculum Expectations

The *Performance Tasks* address the following:

- all of the Curriculum Expectations from the Financial Applications of Sequences and Series strand of the Functions and Relations (university) course and the Functions (university/college) course
- the Curriculum Expectations from Tools for Communicating with Functions strand that deal with Communicating Mathematical Reasoning

Use of Technology

Students should have access to technology as they work on these tasks. Many of the tasks require technology such as graphing calculators or spreadsheet software. Financial software for analyzing Canadian mortgages and other payments over time should also be available, if possible. Students may access this type of software from the Web sites of Canadian financial institutions.

Financial Applications of Sequences and Series

Overall Expectations Addressed by the Performance Tasks

- LC2.05U illustrate the conics as intersections of planes with cones, using concrete materials or technology
- FAV.01 solve problems involving arithmetic and geometric sequences and series
- FAV.02 solve problems involving compound interest and annuities
- FAV.03 solve problems involving financial decision making, using spreadsheets or other appropriate technology

Specific Expectations

Solving Problems Involving Arithmetic and Geometric Sequences and Series

- FA1.01(U/C) write terms of a sequence, given the formula for the n th term
- FA1.01(U) write terms of a sequence, given the formula for the n th term or given a recursion formula
- FA1.02 determine a formula for the n th term of a given sequence (e.g., the n th term of the sequence $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}$ is $\frac{n}{n+1}$)
- FA1.03 identify sequences as arithmetic or geometric, or neither
- FA1.04 determine the value of any term in an arithmetic or a geometric sequence, using the formula for the n th term of the sequence
- FA1.05 determine the sum of the terms of an arithmetic or a geometric series, using appropriate formulas and techniques

Solving Problems Involving Compound Interest and Annuities

- FA2.01 derive the formulas for compound interest and present value, the amount of an ordinary annuity, and the present value of an ordinary annuity, using the formulas for the n th term of a geometric sequence and the sum of the first n terms of a geometric series
- FA2.02 solve problems involving compound interest and present value
- FA2.03 solve problems involving the amount and the present value of an ordinary annuity
- FA2.04 demonstrate an understanding of the relationships between simple interest, arithmetic sequences, and linear growth
- FA2.05 demonstrate an understanding of the relationships between compound interest, geometric sequences, and exponential growth

Solving Problems Involving Financial Decision Making

- FA3.01 analyse the effects of changing the conditions in long-term savings plans (e.g., altering the frequency of deposits, the amount of deposit, the interest rate, the compounding period, or a combination of these) (Sample problem: Compare the results of making an annual deposit of \$1000 to an RRSP, beginning at age 20, with the results of making an annual deposit of \$3000, beginning at age 50)
- FA3.03 generate amortization tables for mortgages, using spreadsheets or other appropriate software
- FA3.04 analyse the effects of changing the conditions of a mortgage (e.g., the effect on the length of time needed to pay off the mortgage or changing the payment frequency or the interest rate)
- FA3.05 communicate the solutions to problems and the findings of investigations with clarity and justification

Tools for Operating and Communicating with Functions

Overall Expectations

- OCV.03 communicate mathematical reasoning with precision and clarity throughout the course

Specific Expectations

Communicating Mathematical Reasoning

- OC3.01 explain mathematical processes, methods of solution, and concepts clearly to others
- OC3.02 present problems and their solutions to a group, and answer questions about the problems and the solutions
- OC3.03 communicate solutions to problems and to findings of investigations clearly and concisely, orally and in writing, using an effective integration of essay and mathematical forms
- OC3.04 demonstrate the correct use of mathematical language, symbols, visuals (e.g., diagrams, graphs), and conventions

Unless noted otherwise, all expectations are common to both the Functions course and the Functions and Relations course.

Expectation	Task					
	Task #1, text p. 207 Building a Pyramid (60–70 min)	Task #2, text p. 207 Population Growth (45–60 min)	Task #3, text p. 207 A Picture Is Worth a Thousand Words (60–75 min)	Task #4, text p. 208 Retirement Plans (45–60 min)	Task #5, text p. 208 Buying a Car (70–100 min)	Task #6, text p. 208 Prescribing Medicine (70–120 min)
FA1.01	X					
FA1.02	X					
FA1.03	X	X			X	
FA1.04	X	X			X	X
FA1.05	X	X		X	X	
FA2.01				X	X	X
FA2.02		X			X	X
FA2.03				X	X	
FA2.04						
FA2.05		X			X	X
FA3.01			X	X	X	X
FA3.03			X			
FA3.04			X			
FA3.05	X	X	X	X	X	X
OC3.01			X		X	X
OC3.02			X	X		
OC3.03	X		X	X	X	X
OC3.04	X	X	X		X	