

Specific Expectations Addressed in the Chapter

- 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

The following expectations are common to both Functions and Relations course and the Functions course:

- FA17.02 determine a formula for the n th term of a given sequence (e.g., the n th term of the sequence $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots$ 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
- 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
- OC1.08 simplify and evaluate expressions containing integer and rational exponents, using the laws of exponents
- OC1.09 solve exponential equations (e.g., $4^x = 8^{x+3}$, $2^{2x} - 2^x = 12$)
- 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
- OC3.05 use graphing technology effectively (e.g., use appropriate menus and algorithms; set the graph window to display the appropriate section of a curve)

What “big ideas” should students develop in this chapter?

Students who have successfully completed the work of this chapter and who understand the essential concepts and procedures will know the following:

- Many examples of growth or decay can be modelled with a sequence.
- When growth or decay follows a pattern, a mathematical model can be used to make predictions.
- Common patterns for sequences include a common difference (arithmetic) or a common ratio (geometric).
- Elements of a sequence can be described with respect to the positions of the elements in the sequence, or by referring to the previous element.

What do students already know about the work of the chapter?

In previous courses, students have

- compared linear growth and quadratic growth with respect to the nature of change using graphs and first differences
- used tables, graphs, calculations, and formulas to report the findings of an investigation
- practised identifying patterns as a reliable problem-solving tool