Sequences and Series

1

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF9 Analyze arithmetic sequences and series to solve problems.

RF10 Analyze geometric sequences and series to solve problems.

By the end of this chapter, students will be able to:

Section	Understanding Concepts, Skills, and Processes
1.1	✓ derive a rule for determining the general term of an arithmetic sequence
	✓ determine t_1, d, n, or t_n in a problem that involves an arithmetic sequence
	✓ describe the relationship between an arithmetic sequence and a linear function
	✓ solve a problem that involves an arithmetic sequence
1.2	✓ derive a rule for determining the sum of an arithmetic series
	✓ determine the values of t_1, d, n, or S_n in an arithmetic series
	✓ solve a problem that involves an arithmetic series
1.3	✓ provide and justify an example of a geometric sequence
	✓ derive a rule for determining the general term of a geometric sequence
	✓ solve a problem that involves a geometric sequence
1.4	✓ derive a rule for determining the sum of n terms of a geometric series
	✓ determine t_1, r, n, or S_n involving a geometric series
	✓ solve a problem that involves a geometric series
	✓ identify any assumptions made when identifying a geometric series
1.5	✓ generalize a rule for determining the sum of an infinite geometric series
	✓ explain why a geometric series is convergent or divergent
	✓ solve a problem that involves a geometric sequence or series

Assessment	Supporting Learning
Assessment *as* Learning	
Use the Before column of **BLM 1–1 Chapter 1 Self-Assessment** to provide students with the big picture for this chapter and help them identify what they already know, understand, and can do. You may wish to have students keep this master in their math portfolio and refer back to it during the chapter.	• During work on the chapter, have students keep track of what they need to work on. They can check off each item as they develop the skill or process at an appropriate level.
Assessment *for* Learning	
Method 1: Use the introduction on page 4 in *Pre-Calculus 11* to activate student prior knowledge about the skills and processes that will be covered in this chapter. **Method 2:** Have students develop a journal entry to explain what they personally know about sequences. You might provide the following prompts: • Where have you encountered the term *sequences* before? • Where have you encountered Fibonacci sequences before? • Have you ever used a list of values? • What rule was used to produce the list of values?	• Have students use their list of what they need to work on to keep track of the skills and processes that need attention. They can check off each item as they develop the skill or process at an appropriate level. • Students who require activation of prerequisite skills may wish to complete **BLM 1–2 Chapter 1 Prerequisite Skills**. This material is on the Teacher CD of this Teacher's Resource and mounted on the www.mhrprecalc11.ca book site.
Assessment *as* Learning	
As students work on each section in Chapter 1, have them keep track of any problems they are having.	• As students complete each section, have them review the list of items they need to work on and check off any that have been handled. • Encourage students to write definitions for the Key Terms in their own words, including reminder tips that may be helpful for review throughout the chapter. • Encourage students to write examples of their own into their notebooks or math portfolios. They should have an example for each method that is covered in the chapter.
Assessment *for* Learning	
BLM 1–3 Chapter 1 Warm-Up This reproducible master includes a warm-up to be used at the beginning of each section. Each warm-up provides a review of prerequisite skills needed for the section.	• As students complete questions, note which skills they are retaining and which ones may need additional reinforcement. • Use the warm-up to provide additional opportunities for students to demonstrate their readiness for the chapter material. • Have students share their strategies for completing math calculations.

Chapter 1 Planning Chart

Section/ Suggested Timing	Prerequisite Skills	Materials/Technology	Teacher's Resource Blackline Masters	Exercise Guide	Assessment *as* Learning	Assessment *for* Learning	Assessment *of* Learning
Chapter Opener • 30–60 min (TR page 7)	Students should be familiar with • pencil and ruler construction	• centimetre grid paper • ruler	BLM 1–1 Chapter 1 Self-Assessment BLM 1–2 Chapter 1 Prerequisite Skills BLM U1–1 Unit 1 Project Checklist				
1.1 Arithmetic Sequences • 100–120 min (TR page 10)	Students should be familiar with • algebraic operations • function evaluation by substitution • graphing functions using technology • solving linear systems of equations • problem solving strategies		BLM 1–3 Chapter 1 Warm-Up BLM 1–4 Section 1.1 Extra Practice TM 1–1 How to Do Page 11 Example 1 Using TI-Nspire™ TM 1–2 How to Do Page 11 Example 1 Using TI-83/84 TM 1–3 How to Do Page 21 #28 Using TI-Nspire™ TM 1–4 How to Do Page 21 #28 Using Microsoft® Excel™	**Essential:** #1–7, 9, 14 or 17, 19, 26, 27 **Typical:** #1–10, 11 or 12, 13 or 14, three of 15–23, 26–28 **Extension/Enrichment:** #8, 11, 12, 15, 18–22, 24–26, 28	TR pages 12, 18	TR pages 15, 18	
1.2 Arithmetic Series • 60–90 min (TR page 19)	Students should be familiar with • pencil and ruler construction • algebraic operations • function evaluation by substitution • graphing functions using technology • solving linear systems of equations • problem solving strategies	• counting disks • centimetre grid paper • ruler	BLM 1–3 Chapter 1 Warm-Up BLM 1–5 Section 1.2 Extra Practice	**Essential:** #1, 2a)–c), 3b), c), e), 4–6, 7a), 8, 10, 11, 13, 15, 18, 22 **Typical:** #1–7, 9–11, 13, 15, 16, 18, 22, 24 **Extension/Enrichment:** #8, 12, 14–24	TR pages 21, 25	TR pages 23, 25	
1.3 Geometric Sequences • 90–150 min (TR page 26)	Students should be familiar with • algebraic operations • function evaluation by substitution • graphing functions using technology • solving linear systems of equations • problem solving strategies • operations with exponents and radicals • operations with fractions	• coins	BLM 1–3 Chapter 1 Warm-Up BLM 1–6 Section 1.3 Extra Practice	**Essential:** #1–10, 12 or 14, one of 15–19, 25 **Typical:** #1–10, 12 or 14, two of 15–19, 20, 25 **Extension/Enrichment:** #7, 11, 19–27	TR pages 27, 33	TR pages 30, 33	
1.4 Geometric Series • 120–150 min (TR page 34)	Students should be familiar with • pencil and ruler construction • algebraic operations • function evaluation by substitution • graphing functions using technology • solving linear systems of equations • problem solving strategies • operations with exponents and radicals • operations with fractions	• ruler • isometric dot paper	BLM 1–3 Chapter 1 Warm-Up BLM 1–7 Section 1.4 Extra Practice TM 1–5 How to Do Page 49 Example 1a) Using TI-Nspire™ TM 1–6 How to Do Page 49 Example 1a) Using TI-83/84	**Essential:** #1–10, 12, 14, 20–22 **Typical:** #1–10, 12, 14, 20–22 **Extension/Enrichment:** #11, 12, 15–19, 20–22	TR pages 35, 40	TR pages 37, 40	
1.5 Infinite Geometric Series • 100–120 min (TR page 41)	Students should be familiar with • pencil and ruler construction • algebraic operations • function evaluation by substitution • graphing functions using technology • solving linear systems of equations • problem solving strategies • operations with exponents and radicals • operations with fractions	• centimetre grid paper • ruler • scissors	BLM 1–3 Chapter 1 Warm-Up BLM 1–8 Section 1.5 Extra Practice	**Essential:** #1, 2, 3a), b), 4, 5a), c), 6, 7, 9, 12, 14, 20–22 **Typical:** #1, 2, 3a), b), 4, 5a), c), 6–11, 13, one of 15–17, 20–22 **Extension/Enrichment:** #11, 14, 18–22	TR pages 42, 46	TR pages 44, 46	
Chapter 1 Review • 60–90 min (TR page 47)		• 0.5 centimetre grid paper • ruler	BLM 1–4 Section 1.1 Extra Practice BLM 1–5 Section 1.2 Extra Practice BLM 1–6 Section 1.3 Extra Practice BLM 1–7 Section 1.4 Extra Practice BLM 1–8 Section 1.5 Extra Practice	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.		TR pages 47	
Chapter 1 Practice Test • 30–45 min (TR page 48)			BLM 1–9 Chapter 1 Test	Provide students with the number of questions they can comfortably do in one class. Choose at least one question for each concept, skill, or process. **Minimum:** #1–10	TR page 48		TR page 48 BLM 1–9 Chapter 1 Test
Unit 1 Project • 30–40 min (TR page 49)			BLM U1–1 Unit 1 Project Checklist BLM 1–10 Chapter 1 BLM Answers			TR page 49	