Rational Functions

9

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF14 Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials or trinomials).

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

Section	Understanding Concepts, Skills, and Processes
9.1	✓ graph, analyse, and compare rational functions using transformations and using technology
	✓ examine the behaviour of the graphs of rational functions near non-permissible values.
9.2	✓ graph, analyse, and compare rational functions
	✓ determine whether graphs of rational functions have an asymptote or a point of discontinuity for a non-permissible value
9.3	✓ relate the roots of rational equations to the x-intercepts of the graphs of rational functions
	✓ determine approximate solutions to rational equations graphically

Assessment	Supporting Learning
Assessment *for* Learning	
Method 1: Use the introduction on page 428 in *Pre-Calculus 12* to activate students' 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 rational functions.	• Have students update their list of what they need to work on and keep track of the skills and processes that need attention. • Students who require activation of prerequisite skills may wish to complete **BLM 9–1 Chapter 9 Prerequisite Skills**. This material is on the Teacher CD of this Teacher's Resource and mounted on the www.mcgrawhill.ca/school/learningcentres book site.
Assessment *as* Learning	
As students work on each section in Chapter 9, 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 in their notebook or math portfolio. Students should have an example for each method that is covered in the chapter.
Assessment *for* Learning	
BLM 9–1 Chapter 9 Prerequisite Skills This master provides a review of prerequisite skills needed for the chapter	• Use the Prerequisite Skills blackline master to provide additional opportunities for students to demonstrate their readiness for the chapter material.

Chapter 9 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	Web Link www.mcgrawhill.ca/ school/learningcentres
Chapter Opener • 30–40 min (TR page 231)	Students should be familiar with • equations and functions • rational versus irrational expressions		BLM 9–1 Chapter 9 Prerequisite Skills BLM U4–1 Unit 4 Project Checklist					• accounting careers and educational programs
9.1 Exploring Rational Functions Using Transformations • 90–120 min (TR page 233)	Students should be familiar with • graphing, using a table of values and technology • transformations • factoring polynomials	• graphing technology	BLM 9–2 Section 9.1 Extra Practice	**Essential:** #1–4, 6, 8, 10, 11, 13, 16 or 18 **Typical:** #1–3, 5–10, 12, 14 or 15, one of 16–18, C1–C3 **Extension/Enrichment:** #5, 7, 9, 17, 19–22, C1–C3	TR pages 235, 240	TR pages 238, 240		• tourism information about Atlin, BC
9.2 Analysing Rational Functions • 60–90 min (TR page 241)	Students should be familiar with • non-permissible values • asymptotes	• graphing technology	BLM 9–3 Section 9.2 Extra Practice	**Essential:** #1, 2a), b), 3, 4a), b), 5, 6a), b), 7, one of 13–15 **Typical:** #1, 2c), d), 3, 4c), d), 6–15, one of 16–19, C1–C3 **Extension/Enrichment:** #8, 10, 11, 16–23, C1–C3	TR pages 242, 245	TR pages 244, 245		
9.3 Connecting Graphs and Rational Equations • 90–120 min (TR page 246)	Students should be familiar with • solving equations algebraically • the relationship between roots and x-intercepts • calculating intersection points and their significance	• graphing technology	BLM 9–4 Section 9.3 Extra Practice	**Essential:** #1, 2, 3a), b), 4a), b), 5, 7, 11 **Typical:** #1, 2, 3c), d), 4c), d), 5–7, 8 or 9, 10, 12 or 13, C1–C3 **Extension/Enrichment:** #6, 8 or 9, 10, 12 or 13, 14–17, C1–C3	TR pages 247, 250	TR pages 249, 250		• information on the Canadian Francophone Games
Chapter 9 Review and Practice Test • 60–90 min each (TR page 251)		• graphing technology • poster board	BLM 9–2 Section 9.1 Extra Practice BLM 9–3 Section 9.2 Extra Practice BLM 9–4 Section 9.3 Extra Practice BLM 9–5 Chapter 9 Study Guide BLM 9–6 Chapter 9 Test BLM 9–7 Chapter 9 BLM Answers	Have students do at least one question related to any concept, skill, or process that has been giving them trouble. **Chapter 9 Review minimum:** #1–3, 4–9, 11 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. **Chapter 9 Practice Test minimum:** #1–12		TR page 252	TR page 252 BLM 9–6 Chapter 9 Test	• information on spill modelling