Linear and Quadratic Inequalities

9

General Outcome
Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes
RF7 Solve problems that involve linear and quadratic inequalities in two variables.

RF8 Solve problems that involve quadratic inequalities in one variable.

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

Section	Understanding Concepts, Skills, and Processes
9.1	✓ explain, using examples, when a solid or a broken line should be used in the solution to a linear inequality
	✓ explain, using examples, how to use test points to find the solution to a linear inequality
	✓ sketch, with or without technology, the graph of a linear inequality
	✓ solve a problem that involves a linear inequality
9.2	✓ develop strategies to solve quadratic inequalities in one variable, and explain the strategy used
	✓ model and solve problems using quadratic inequalities in one variable
	✓ interpret quadratic inequalities in one variable to determine solutions to problems
9.3	✓ explain, using examples, how to use test points to find the solution to a quadratic inequality in two variables
	✓ explain, using examples, when a solid or a broken line should be used in the solution to a quadratic inequality in two variables
	✓ sketch, with or without technology, the graph of a quadratic inequality in two variables
	✓ solve a problem that involves a quadratic inequality in two variables

Assessment	Supporting Learning
Assessment *as* Learning	
Use the Before column of **BLM 9–1 Chapter 9 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 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 462 in *Pre-Calculus 11* 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 inequalities, factoring expressions, and graphing and solving equations.	• 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 9–2 Chapter 9 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 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 9–3 Chapter 9 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 mathematics calculations.

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
Chapter Opener • 10–15 min (TR page 315)	Students should be familiar with • inequalities • solving equations	• computer with Internet access	BLM 9–1 Chapter 9 Self-Assessment BLM 9–2 Chapter 9 Prerequisite Skills BLM U4–1 Unit 4 Project Checklist				
9.1 Linear Inequalities in Two Variables • 60–120 min (TR page 317)	Students should be familiar with • graphing linear equations • inequalities • plotting points on a graph • solving equations • slope • slope–intercept form • x- and y-intercepts • writing an equation to solve a problem • graphing technology	• grid paper • straight edge • graphing calculator • computer with graphing software	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid Paper BLM 9–3 Chapter 9 Warm-Up BLM 9–4 Section 9.1 Extra Practice TM 9–1 How to Do Page 470 Example 4 Using TI-Nspire™ TM 9–2 How to Do Page 470 Example 4 Using TI-83/84	**Essential:** #1, 3, 4, 6–11, 19, 20 **Typical:** #2, 3, 5–9, 11–14, 19–21 **Extension/Enrichment:** #8, 9, 14, 16–21	TR pages 319, 323	TR pages 321, 323	
9.2 Quadratic Inequalities in One Variable • 120–180 min (TR page 324)	Students should be familiar with • inequalities • zeros of a function • solving equations • graphing functions • domain and range • roots of an equation • number lines • factoring expressions • graphing technology	• grid paper • coloured pens, pencils, or markers • graphing calculator • computer with graphing software • straight edge	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid Paper BLM 9–3 Chapter 9 Warm-Up BLM 9–5 Section 9.2 Extra Practice	**Essential:** #1, 3–10, 13, 19, 20 **Typical:** #1, 3–9, 11–13, 18–20 **Extension/Enrichment:** #8, 9, 11, 12, 14–20	TR pages 325, 329	TR pages 327, 328, 329	
9.3 Quadratic Inequalities in Two Variables • 60–120 min (TR page 330)	Students should be familiar with • inequalities • graphing quadratic functions • solving equations • graphing technology • domain and range • writing an equation to solve a problem • plotting points on a graph • the vertex of a parabola • roots of an equation • x- and y-intercepts	• grid paper • coloured pens, pencils, or markers • graphing calculator • computer with graphing software • straight edge • sticky notes • computer with Internet access • magazines, newspapers	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid Paper BLM 9–3 Chapter 9 Warm-Up BLM 9–6 Section 9.3 Extra Practice	**Essential:** #1–6, 9, 10, 16–18 **Typical:** #1–6, 9, one of 10–12, 16–18 **Extension/Enrichment:** #4, 5, 7, 13–18	TR pages 332, 336	TR pages 335, 336	
Chapter 9 Review • 60–75 min (TR page 337)		• grid paper • straight edge • coloured pens, pencils, or markers • graphing calculator • computer with graphing software	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid Paper BLM 9–4 Section 9.1 Extra Practice BLM 9–5 Section 9.2 Extra Practice BLM 9–6 Section 9.3 Extra Practice	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.		TR page 337	
Chapter 9 Practice Test • 50–60 min (TR page 338)		• grid paper • straight edge • coloured pens, pencils, or markers • graphing calculator	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid BLM 9–7 Chapter 9 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:** #1–7, 9	TR page 339		TR page 339 BLM 9–7 Chapter 9 Test
Unit 4 Project • 60–105 min (TR page 340)			BLM U4–1 Unit 4 Project Checklist			TR page 340	
Unit 4 Project Wrap-Up • 30 min (TR page 341)			Master 1 Project Rubric BLM U4–1 Unit 4 Project Checklist BLM U4–2 Unit 4 Project Rubric				TR page 342 Master 1 Project Rubric
Unit 4 Cumulative Review and Test • 60–120 min (TR page 343)		• grid paper • straight edge • coloured pens, pencils, or markers	Master 2 Centimetre Grid Paper Master 3 0.5 Centimetre Grid Paper BLM U4–3 Unit 4 Test BLM 9–8 Chapter 9 BLM Answers	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.		TR page 343	TR page 343