CHAPTER

7

Quadratic Expressions

Strand
Quadratic Relations of the Form $y = ax^2 + bx + c$

Student Text Pages
276–277

Suggested Timing
60–80 min

Tools
- computers (optional)
- Internet access (optional)

Related Resources
BLM 7.CO.1 Literacy Link: Concept Web

Key Terms

difference of squares
factor
perfect square trinomial
quadratic expression

Additional information and teaching materials for this chapter are available on the McGraw–Hill Ryerson web site at http://mcgrawhill.ca/books/foundations10. You will need your password to access this material.

Chapter Curriculum Specific Expectations

Manipulating Quadratic Expressions

In this chapter, students will

QR1.01 expand and simplify second-degree polynomial expressions involving one variable that consist of the product of two binomials [e.g., $(2x + 3)(x + 4)$] or the square of a binomial [e.g., $(2x + 3)^2$], using a variety of tools (e.g., algebra tiles, diagrams, computer algebra systems, paper and pencil) and strategies (e.g., patterning)

QR1.02 factor binomials (e.g., $4x^2 + 8x$) and trinomials (e.g., $3x^2 + 9x - 15$) involving one variable up to degree two, by determining a common factor using a variety of tools (e.g., algebra tiles, diagrams, computer algebra systems, paper and pencil) and strategies (e.g., patterning)

QR1.03 factor simple trinomials of the form $x^2 + bx + c$ (e.g., $x^2 + 7x + 10$, $x^2 + 2x - 8$) using a variety of tools (e.g., algebra tiles, diagrams, computer algebra systems, paper and pencil) and strategies (e.g., patterning)

QR1.04 factor the difference of squares of the form $x^2 - a^2$ (e.g., $x^2 - 16$)

Teaching Suggestions

Chapter Opener

- Survey the class to see if anyone has visited Science North or heard about it. Have them describe a feature or exhibit they found interesting.
- Read the opening text with students.
- Ask what students know about quadratic expressions. Has anyone heard the term before? What do they think the chapter might be about?
- Have students start a concept web, using **BLM 7.CO.1 Literacy Link: Concept Web**. You might want to encourage students to build the web as they work through the chapter, to help build their understanding of the link between these mathematical ideas.

Literacy Link

- Have students brainstorm, then write their ideas on cue-cards to use to make a class concept web on the wall. Use string or painter's tape to connect the ideas. You may wish to use **BLM 7.CO.1 Literacy Link: Concept Web** to help students complete this task.
  For more information on the Think Literacy program, visit http://www.edu.gov.on.ca/eng/studentsuccess/thinkliteracy.

Career Profile

- Have students research individually, or in pairs, to learn more about the work of interior designers. They could contact Interior Designers of Canada or one of the interior design schools for information. Alternatively, consult a guidance counsellor at the school.
- Students should detail the education required and skills used on the job as well as the salary range and career outlook. Service Canada's Job Futures web site is a good starting point.
- Interested students could report their findings as a poster highlighting this career. Encourage them to include some sample calculations a designer would make.
- Discuss other careers that use math skills to find physical dimensions, such as painters, boat builders, or flooring installers.
- Invite an interior designer to speak to the class about the nature and scope of their projects and how math (specifically quadratic expressions) is used in their work.

Chapter 7 Planning Chart

Section Suggested Timing	Student Text Page(s)	Teacher's Resource Blackline Masters	Assessment	Tools
Chapter 7 Opener • 60–80 min	276–277	• BLM 7.CO.1 Literacy Link: Concept Web		• computers (optional) • Internet access (optional)
Get Ready! • 80 min	278–279	• BLM 7.GR.1 Practice: Get Ready	• BLM 7.GR.2 Get Ready Self-Assessment Checklist	• algebra tiles • calculators
7.1 Multiply Two Binomials • 80 min	280–289	• BLM 7.1.1 Practice: Multiply Two Binomials • BLM T2 The Computer Algebra System (CAS) on the TI–89 Calculator		• algebra tiles • Computer Algebra System (CAS)
7.2 Common Factoring • 80 min	290–297	• BLM 7.2.1 Practice: Common Factoring • BLM T2 The Computer Algebra System (CAS) on the TI–89 Calculator	• BLM 7.2.2 Achievement Check Rubric	• algebra tiles • Computer Algebra System (CAS)
7.3 Factor a Difference of Squares • 80 min	298–305	• BLM 7.3.1 Practice: Factor a Difference of Squares • BLM G1 Grid Paper • BLM T1 *The Geometer's Sketchpad*® 4		• computers • *The Geometer's Sketchpad*® • grid paper • ruler • scissors
7.4 Factor Trinomials of the Form $x^2 + bx + c$ • 80 min	306–311	• BLM 7.4.1 Practice: Factor Trinomials of the Form $x^2 + bx + c$	• BLM 7.4.2 Achievement Check Rubric	• algebra tiles
Chapter 7 Review • 80 min	312–313	• BLM 7.CR.1 Chapter 7 Review • BLM G1 Grid Paper • BLM T2 The Computer Algebra System (CAS) on the TI–89 Calculator		• algebra tiles • Computer Algebra System (CAS) • grid paper
Chapter 7 Practice Test • 80 min	314–315	• BLM G1 Grid Paper • BLM T2 The Computer Algebra System (CAS) on the TI–89 Calculator	• BLM 7.PT.1 Chapter 7 Practice Test • BLM 7.CT.1 Chapter 7 Test	• Computer Algebra System (CAS) • grid paper
Chapter 7 Problem Wrap-Up • 80 min	315	• BLM G1 Grid Paper • BLM T1 *The Geometer's Sketchpad*® 4	• BLM 7.CP.1 Chapter 7 Problem Wrap-Up Rubric	• computers • *The Geometer's Sketchpad*® • grid paper

Chapter 7 Blackline Masters Checklist

	Title		Purpose
Chapter 7 Opener			
	BLM 7.CO.1	Literacy Link: Concept Web	Literacy
Get Ready!			
	BLM 7.GR.1	Practice: Get Ready	Practice
	BLM 7.GR.2	Get Ready Self-Assessment Checklist	Self-Assessment
7.1 Multiply Two Binomials			
	BLM 7.1.1	Practice: Multiply Two Binomials	Practice
	BLM T2	The Computer Algebra System (CAS) on the TI–89 Calculator	Technology
7.2 Common Factoring			
	BLM 7.2.1	Practice: Common Factoring	Practice
	BLM 7.2.2	Achievement Check Rubric	Assessment
	BLM T2	The Computer Algebra System (CAS) on the TI–89 Calculator	Technology
7.3 Factor a Difference of Squares			
	BLM 7.3.1	Practice: Factor a Difference of Squares	Practice
	BLM G1	Grid Paper	Student Support
	BLM T1	*The Geometer's Sketchpad*® 4	Technology
7.4 Factor Trinomials of the Form $x^2 + bx + c$			
	BLM 7.4.1	Practice: Factor Trinomials of the Form $x^2 + bx + c$	Practice
	BLM 7.4.2	Achievement Check Rubric	Assessment
Chapter 7 Review			
	BLM 7.CR.1	Chapter 7 Review	Review
	BLM G1	Grid Paper	Student Support
	BLM T2	The Computer Algebra System (CAS) on the TI–89 Calculator	Technology
Chapter 7 Practice Test			
	BLM 7.PT.1	Chapter 7 Practice Test	Diagnostic Assessment
	BLM 7.CT.1	Chapter 7 Test	Summative Assessment
	BLM G1	Grid Paper	Student Support
	BLM T2	The Computer Algebra System (CAS) on the TI–89 Calculator	Technology
Chapter 7 Problem Wrap-Up			
	BLM 7.CP.1	Chapter 7 Problem Wrap-Up Rubric	Summative Assessment
	BLM G1	Grid Paper	Student Support
	BLM T1	*The Geometer's Sketchpad*® 4	Technology

Get Ready!

Student Text Pages
278–279

Suggested Timing
80 min

Tools
- algebra tiles
- calculators

Related Resources
BLM 7.GR.1 Practice: Get Ready
BLM 7.GR.2 Get Ready Self-Assessment Checklist

Common Errors

- Some students may add the exponents when collecting like terms (e.g., $5x^2 + 3x^2 = 8x^4$).

R_x Have students perform a sample calculation to show that this does not work.

- Some students may mistake the negative signs for subtraction.

R_x Have students use a highlighter or coloured pen to mark any negative signs before they start.

Accommodations

ESL—Break the terms apart into syllables, highlighting the root word in each. Have students write out the definitions for each root and add them to the Word Wall or their glossary. Have them develop alternative wording for the instructions such as "simplify" or "evaluate."

Language—Read questions aloud to the class. Ask a student to explain what is being asked, or perform a sample calculation on the board. Discuss any misunderstandings.

Perceptual—You may wish to provide algebra tiles for students to use when answering the Get Ready questions.

Teaching Suggestions

- The Get Ready questions will help students ensure they have a grasp of the math skills needed for this chapter. Have students complete the Get Ready questions and note any areas they need to practice.
- Use **BLM 7.GR.1 Practice: Get Ready** for extra practice or remediation.
- All BLMs referred to throughout this chapter can be found in the *Foundations of Mathematics 10: Teacher's Resource* CD-ROM.

Assessment

- Assess student readiness to proceed by informal observation as students are working on the questions. A formal test would be inappropriate since this material is not part of the grade 10 curriculum for this chapter.
- Student self-assessment is also an effective technique; students can place a checkmark beside topics in the Get Ready in which they feel confident with the necessary skills. You may wish to use **BLM 1.GR.2 Get Ready Self-Assessment Checklist** as a self-assessment for students.
- Remedial action can be taken in small groups or with a whole class skills review.

Chapter Problem

- Have students discuss their understanding of the topic and associated vocabulary.
- The Chapter Problem questions throughout the chapter are designed to help students move toward the Chapter Problem Wrap-Up.
- You may wish to assign these questions as students work through the sections. Alternatively, you may wish to assign the Chapter Problem questions and Chapter Problem Wrap-Up when students have completed the chapter, as part of a summative assessment.