Quadratic Expressions

Vocabulary

perfect square trinomial
difference of squares
quadratic expression

Curriculum Expectations

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

Solving Quadratic Equations

By the end of this chapter, students will

QR3.01 expand and simplify second-degree polynomial expressions [e.g., $(2x + 5)^2$, $(2x - y)(x + 3y)$], using a variety of tools (e.g., algebra tiles, diagrams, computer algebra systems, paper and pencil) and strategies (e.g., patterning);

QR3.02 factor polynomial expressions involving common factors, trinomials, and differences of squares [e.g., $2x^2 + 4x$, $2x - 2y + ax - ay$, $x^2 - x - 6$, $2a^2 + 11a + 5$, $4x^2 - 25$], using a variety of tools (e.g., concrete materials, computer algebra systems, paper and pencil) and strategies (e.g., patterning).

Chapter Problem

The Chapter Problem is introduced in the Chapter 5 Opener. Have students discuss their understanding of prisms and area formulas. Have students complete the Chapter Problem revisits that occur throughout the chapter. These questions are designed to help students move toward the Chapter 5 Problem Wrap-Up on page 257.

Alternatively, assign only the Chapter Problem when students have completed the chapter. The Chapter Problem is a summative assessment.

Chapter 5 Planning Chart

Section Suggested Timing	Student Text Pages	Teacher›s Resource Blackline Masters	Assessment	Tools
Chapter 5 Opener • 10 min	206–207			
Get Ready • 30–40 min	208–209	• BLM 5–1 Get Ready	• BLM 5–2 Get Ready Self- Assessment Checklist	**Tools** • algebra tiles
5.1 Multiply Polynomials • 70 min	210–219	• BLM 5–3 Section 5.1 Practice Master • T–4 *The Geometer's Sketchpad®* 3 • T–5 *The Geometer's Sketchpad®* 4 • T–7 The Computer Algebra System (CAS) on the TI-89 Calculator	• A–8 Application General Scoring Rubric	**Tools** • algebra tiles **Technology Tools** • computer • *The Geometer's Sketchpad®* • Algebra Tiles.gsp • TI-89 calculator
5.2 Special Products • 70 min	220–227	• BLM 5–4 Section 5.2 Practice Master • T–7 The Computer Algebra System (CAS) on the TI-89 Calculator	• BLM 5–5 Section 5.2 Achievement Check Rubric	**Tools** • algebra tiles **Technology Tools** • TI-89 calculator
5.3 Common Factors • 70 min	228–235	• BLM 5–6 Section 5.3 Practice Master • T–7 The Computer Algebra System (CAS) on the TI-89 Calculator	• A–9 Communication General Scoring Rubric	**Tools** • algebra tiles **Technology Tools** • TI-89 calculator
5.4 Factor Quadratic Expressions of the Form $x^2 + bx + c$ • 70 min	236–241	• BLM 5–7 Section 5.4 Practice Master	• A–10 Observation General Scoring Rubric	**Tools** • algebra tiles
5.5 Factor Quadratic Expressions of the Form $ax^2 + bx + c$ • 70–140 min	242–247	• G–2 Placemat • BLM 5–8 Section 5.5 Practice Master	• BLM 5–9 Section 5.5 Achievement Check Rubric • A–6 Knowledge/Understanding General Scoring Rubric • A–9 Communication General Scoring Rubric	**Tools** • algebra tiles **Technology Tools** • TI-89 calculator
5.6 Factor a Perfect Square Trinomial and a Difference of Squares • 70 min	248–255	• BLM 5–10 Section 5.6 Practice Master • T–7 The Computer Algebra System (CAS) on the TI-89 Calculator	• A–9 Communication General Scoring Rubric	**Technology Tools** • TI-89 calculator
Chapter 5 Review • 70 min	256–257	• BLM 5–11 Chapter 5 Review		**Tools** • algebra tiles **Technology Tools** • TI-89 calculator
Chapter 5 Problem Wrap-Up • 40 min	257		• BLM 5–12 Chapter 5 Problem Wrap-Up Rubric	
Chapter 5 Practice Test • 70 min	258–259	• BLM 5–16 BLM Answers	• BLM 5–13 Chapter 5 Practice Test • BLM 5–14 Chapter 5 Test • BLM 5–15 Chapter 5 Practice Test Achievement Check Rubric	**Tools** • algebra tiles **Technology Tools** • TI-89 calculator

Chapter 5 Blackline Masters Checklist

	BLM	Title	Purpose
Get Ready			
	BLM 5–1	Get Ready	Practice
	BLM 5–2	Get Ready Self-Assessment Checklist	Student Self-Assessment
5.1 Multiply Polynomials			
	BLM 5–3	Section 5.1 Practice Master	Practice
	T–4	*The Geometer's Sketchpad*® 3	Technology
	T–5	*The Geometer's Sketchpad*® 4	Technology
	T–7	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
	A–8	Application General Scoring Rubric	Assessment
5.2 Special Products			
	BLM 5–4	Section 5.2 Practice Master	Practice
	BLM 5–5	Section 5.2 Achievement Check Rubric	Assessment
	T–7	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
5.3 Common Factors			
	BLM 5–6	Section 5.3 Practice Master	Practice
	T–7	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
	A–9	Communication General Scoring Rubric	Assessment
5.4 Factor Quadratic Expressions of the Form $x^2 + bx + c$			
	BLM 5–7	Section 5.4 Practice Master	Practice
	A–10	Observation General Scoring Rubric	Assessment
5.5 Factor Quadratic Expressions of the Form $x^2 + bx + c$			
	G–2	Placemat	Student Support
	BLM 5–8	Section 5.5 Practice Master	Practice
	BLM 5–9	Section 5.5 Achievement Check Rubric	Assessment
	A–6	Knowledge/Understanding General Scoring Rubric	Assessment
	A–9	Communication General Scoring Rubric	Assessment
5.6 Factor a Perfect Square Trinomial and a Difference of Squares			
	BLM 5–10	Section 5.6 Practice Master	Practice
	T–7	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
	A–9	Communication General Scoring Rubric	Assessment
Chapter 5 Review			
	BLM 5–11	Chapter 5 Review	Practice
Chapter 5 Problem Wrap-Up			
	BLM 5–12	Chapter 5 Problem Wrap-Up Rubric	Summative Assessment

Chapter 5 Practice Test

	BLM 5–13	Chapter 5 Practice Test	Diagnostic Assessment
	BLM 5–14	Chapter 5 Test	Summative Assessment
	BLM 5–15	Chapter 5 Practice Test Achievement Check Rubric	Assessment
	BLM 5–16	BLM Answers	Answers

Get Ready

TI-Navigator™

Go to **www.mcgrawhill.ca/books/ principles10** and follow the links to the file for this section.

Common Errors

• When subtracting polynomials, some students may subtract only the first term in the second set of brackets.

R_x Have students use arrows to illustrate the distributive property. This will show that the subtraction sign changes the sign on every term.

Accommodations

Visual—Allow students to highlight the like terms when simplifying algebraic expressions. For example:

$(3x^2 + 2x + 5) + (4x^2 - x - 3)$

$= 7x^2 + x + 2$

Spatial—Encourage students to use algebra tiles and linking cubes as a visual representation of the questions in this section.

Memory—Let students use a vertical arrangement and show small sequential steps when expressing numbers as a product of their prime factors. For example:

$18 = 2 \times 9$
$\quad = 2 \times 3 \times 3$

Teaching Suggestions

• The skills presented in this Get Ready were taught in grade 9. Questions 1 through 7 should be done before starting Section 5.1. Wait until Section 5.3 to cover factoring and questions 8, 9, and 10.
• This is a good opportunity to teach or review the use of algebra tiles to model polynomials.
• Use **BLM 5–1 Get Ready** for remediation or extra practice.

Assessment

Assess student readiness to proceed by informal observation as students are working on the exercises. 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 check mark beside topics in the Get Ready with which they feel confident of having the necessary skills. Use **BLM 5–2 Get Ready Self-Assessment Checklist** as a self-assessment for students. Remedial action can be taken in small groups or with a whole class skill review.