

Common Core State Standards Integrated Pathway

Support Supplement

for Mathematics I



Program Overview



This program was developed and reviewed by experienced math educators who have both academic and professional backgrounds in mathematics. This ensures: freedom from mathematical errors, grade level appropriateness, freedom from bias, and freedom from unnecessary language complexity.

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Introduction to the Program

Introduction

The *CCSS Integrated Pathway Support Supplement for Mathematics I* was designed to help teachers provide necessary differentiation to support all students in meeting the standards of *CCSS Integrated Pathway: Mathematics I*. These resources may be used in Support, ELL, or Special Education classes, in RTI programs or Math Labs, or with individuals or groups requiring additional support.

The *CCSS Integrated Pathway Support Supplement for Mathematics I* is a complete set of materials developed around the prerequisite skills identified for each lesson of *CCSS Integrated Pathway: Mathematics I*. The Support Supplement provides teachers with the tools necessary to teach, remediate, or review concepts and skills necessary for success in Math I. The components are designed to support students who may have gaps or weaknesses in their grasp of the prerequisite skills, and/or who could benefit from additional support as they work through the Mathematics I course. The Support Supplement provides a variety of instructional approaches to meet the needs of students across the range of learning styles.

In addition to resources for providing instruction in prerequisite skills, the Support Supplement includes instructional strategies for helping students learn the targeted content of each lesson in *CCSS Integrated Pathway: Mathematics I*. The strategy categories include Suggestions for Graphic Organizers/Manipulatives, Suggestions for Discourse, Suggestions for English Language Learners, and Addressing Common Errors/Misconceptions.

In addition to a glossary, the complete *CCSS Integrated Pathway Support Supplement for Mathematics I* includes the following components:

For each lesson:

- Elementary Prerequisite Skills (described by relevant CCSS for grades 3–5)
- Targeted Prerequisite Skills (described by relevant CCSS for grades 6–8)
- Supportive Instructional Strategies for the corresponding Teacher Resource lesson

For each skill:

- Standard(s)
- Essential Questions
- Words to Know
- Recommended Resources
- Recommended Instructional Strategies for Skill Development
- Introduction
- Key Concepts
- Guided Practice
- Scaffolded Practice
- Problem-Based Task
- Problem-Based Task Coaching Questions
- Problem-Based Task Coaching Question Sample Responses
- Closure Activity
- Practice

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Introduction to the Program

Structure of the Teacher Resource

The *CCSS Integrated Pathway Support Supplement for Mathematics I* is provided as a collection of unit books and an overview book. The materials are completely reproducible. You may also have purchased the *CCSS Integrated Pathway Support Supplement for Mathematics I Teacher Resource* in digital format. In this case, electronic “bookmarks” allow you to access the sections quickly and easily. The digital format also facilitates printing and copying student pages.

The Program Overview is the first section. Written for you, this section helps you to navigate the materials, offers a collection of graphic organizers and suggested strategies for their use, and shows how the lessons correlate to the Common Core State Standards for Grades 3–8 and to the units and lessons of the *CCSS Integrated Pathway: Mathematics I Program*.

The remaining materials focus on content, knowledge, and application of the prerequisite skills necessary for success in the CCSS Integrated Pathway Mathematics I curriculum. The materials in the *CCSS Integrated Pathway Support Supplement for Mathematics I* are designed to be flexible so that you can mix and match activities as the needs of your students and your instructional style dictate.

Please note: Throughout the Teacher Resource, page references are provided on the lower, inner corner of some pages. These references indicate the corresponding page(s) in the Student Workbook (SWB) and have been included here to facilitate assigning materials to students.

Glossary

The Glossary contains vocabulary terms and formulas from throughout the program, organized alphabetically. Each listing provides the term and the definition in both English and Spanish to support ELL students. The listings include the skill(s) where the term can be found in the instruction.

PROGRAM OVERVIEW

Unit Structure

All of the instructional units have some common features. Each Support Supplement lesson begins with a list of prerequisite skills and their associated standard(s) as addressed in the corresponding *CCSS Integrated Pathway: Mathematics I* lesson. Instruction for Targeted Practice Skills includes Essential Questions, vocabulary (titled “Words to Know”), and a list of recommended websites to be used as additional resources. Furthermore, Recommended Instructional Strategies for Skill Development relevant to each Targeted Prerequisite Skill are also provided.

Each set of Skill Instruction includes an introduction, key concepts, guided practice examples, scaffolded practice examples, a problem-based task with coaching questions and sample responses, a closure activity, and practice. Each lesson ends with a series of suggestions for supporting students in learning the targeted content of the corresponding *CCSS Integrated Pathway: Mathematics I* lesson.

Targeted Prerequisite Skills that have been addressed in previous lessons in the Support Supplement are revisited in abbreviated form to build on prior knowledge and promote skill-building. Grade-level skills addressed in *CCSS Integrated Pathway: Mathematics I* are not revisited; instead, references are provided to the relevant instruction in *CCSS Integrated Pathway: Mathematics I* for each grade-level skill.

All of the components are described below and on the following pages for your reference.

Elementary and Targeted Prerequisite Skills for the Lesson

All prerequisite skills, including those described by standards from grades 3–5 (Elementary Skills) and those from grades 6–8 (Targeted Skills), that are addressed in the entire lesson are listed.

Common Core State Standards for the Targeted Skill Instruction

The specific standard or standards addressed by the instruction for each Targeted Prerequisite Skill are presented at the beginning of the instruction for that skill.

Common Core Standards for Mathematical Practice for the Targeted Skill

An “SMP” callout box contains the numbers 1–8, corresponding to each of the eight Standards for Mathematical Practice. Check marks indicate which of the SMPs are addressed in the instruction.

Essential Questions

These are intended to guide students’ thinking as they proceed through the skill. By the end of each skill, students should be able to respond to the questions.

Words to Know

Vocabulary terms and formulas are provided as background information for instruction or to review key concepts that are addressed in the skill.

PROGRAM OVERVIEW

Unit Structure

Recommended Resources

This is a list of websites that can be used as additional resources. Some websites are games; others provide additional examples and/or explanations. The links for these resources are live in the PDF version of the Support Supplement. (*Note:* These website links will be monitored and repaired or replaced as necessary.)

Recommended Instructional Strategies for Skill Development

This section offers guidance on appropriate graphic organizers and/or manipulatives for each Targeted Prerequisite Skill, as well as suggestions for discussing and drawing connections to real-life applications of the instructional topic.

Introduction

This section briefly describes concepts about to be presented and may contain some Words to Know.

Key Concepts

Provided in bulleted form, this instruction highlights the important ideas and/or processes for meeting the standard.

Guided Practice

This section provides step-by-step examples of applying the Key Concepts.

Scaffolded Practice

The Guided Practice example problems, without explanations or answers, are provided as worksheets to give students an opportunity to build procedural fluency. The first Scaffolded Practice example provides step-by-step prompts for solving. The remaining examples are presented without prompts.

Problem-Based Task

This activity can be used to walk students through the application of the standard, prior to traditional instruction or at the end of instruction. Addressed Standards for Mathematical Practice are noted.

Problem-Based Task Coaching Questions

These questions scaffold the task and guide students to solving the problem(s) presented in the task.

Problem-Based Task Coaching Questions Sample Responses

These are the answers and suggested appropriate responses to the coaching questions. In some cases answers may vary, but a sample answer is given for each question.

Recommended Closure Activity

Students are given the opportunity to synthesize and reflect on the lesson through a journal entry or discussion of one or more of the Essential Questions.

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Unit Structure

Practice

Each set of Skill Instruction includes practice problems to support students' achievement of the learning objectives. These worksheets are written for the student. They can be used in any combination of teacher-led instruction, cooperative learning, or independent application of knowledge.

Supportive Instructional Strategies for the Teacher Resource

This section offers strategies for supporting students in achieving the standards in the corresponding *CCSS Integrated Pathway: Mathematics I* lesson. These include Suggestions for: Graphic Organizers/ Manipulatives, Discourse, and supporting English Language Learners. It also provides suggestions for Addressing Common Errors/Misconceptions related to the instructional topics.

Answer Key

Answers for all of the Practice problems are provided at the end of each unit.

Elementary Skill Instruction (E-Skills)

Provided in a comprehensive appendix included with the Support Supplement, this collection provides a brief set of Introduction, Guided Practice, and Practice to refresh elementary (grades 3–5) skills as appropriate.

Graphing Calculators

Step-by-step instructions for using a TI-Nspire and a TI-83/84 are provided whenever graphing calculators are referenced.

Digital Instruction

Delivered via PowerPoint, this instruction adds interactive applets to selected examples in each set of Skill Instruction and Guided Practice to illuminate and illustrate key concepts. This can be used in preparation for the class, for teaching, or for helping students catch up after missing class.

Readiness Assessments

Each Readiness Assessment is an optional tool available to help determine gaps in students' prior knowledge. A broad test with one or more problems for each of the Targeted Prerequisite Skills, each Readiness Assessment can be administered at the beginning of the school year or semester to identify the needs of individual students and/or areas of common need. Readiness Assessments are available in both paper-and-pencil and online formats. The assessment results can help to guide decisions about the implementation of the supplemental materials in this program, indicating which students might benefit from review or remediation on particular skills.

PROGRAM OVERVIEW

Standards Correlations

Each lesson in the *CCSS Integrated Pathway Support Supplement for Mathematics I* was written specifically to address one or more Common Core State Standards describing prerequisite skills necessary for achieving the standards in the corresponding lesson of *CCSS Integrated Pathway: Mathematics I*. These standards are drawn from the elementary (grades 3–5) and middle-level (grades 6–8) CCSS. Each lesson lists the standards covered in all the sets of Skill Instruction, and each set of Skill Instruction lists the standards addressed in that specific part. In this section, you'll find a comprehensive list mapping the Support resources to the CCSS describing the identified prerequisite skills.

Single asterisks (*) denote Targeted Prerequisite Skills that have been addressed in previous lessons in the Support Supplement. These topics are revisited in abbreviated form to build on prior knowledge and promote skill-building. Double asterisks (**) denote grade-level skills addressed in *CCSS Integrated Pathway: Mathematics I*. These topics are not revisited; instead, references are provided to the relevant instruction in *CCSS Integrated Pathway: Mathematics I* for each grade-level skill.

The Elementary Prerequisite Skills (E-Skills) are italicized for visual distinction from the targeted skills. (*Note: E-Skills instruction is addressed in the comprehensive appendix.*)

Guide to Common Core State Standards Annotation

As you use this resource, you may come across a symbol included with the Common Core standards for some of the lessons and activities. The description of the star symbol is found below, taken verbatim from the Common Core State Standards Initiative website, at www.corestandards.org.

Symbol: ★

Denotes: Modeling Standards

Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

From <http://www.walch.com/CCSS/00003>

PROGRAM OVERVIEW

Standards Correlations

Unit 1: Relationships Between Quantities			
Lesson	Title	Standard(s)	Pages
Lesson 1	Interpreting Structure in Expressions: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	Skill 1: Translating Verbal Expressions to Algebraic Expressions	6.EE.2a	U1-2
	Skill 2: Evaluating Expressions for a Given Value	6.EE.2c	U1-17
	Skill 3: Identifying Parts of an Expression	6.EE.2b	U1-36
Lesson 2	Creating Equations and Inequalities in One Variable: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	Skill 1: Creating Ratios	6.RP.2	U1-55
	Skill 2: Translating Verbal Sentences into Expressions*	6.EE.2a	U1-72
	Skill 3: Solving Simple Linear Equations	8.EE.7b	U1-77
	Skill 4: Comparing Rational Numbers	6.NS.7a	U1-94
Lesson 3	Creating and Graphing Equations in Two Variables: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Understanding Slope as a Rate of Change	8.EE.5	U1-130
Lesson 4	Representing Constraints: Prerequisite Skills		
	Skill 1: Reading and Writing Inequalities	6.NS.7b	U1-159
	Skill 2: Creating and Evaluating Inputs and Outputs of Equations and Inequalities	8.F.1	U1-173
Lesson 5	Rearranging Formulas: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	Skill 1: Solving Multi-Step Equations*	8.EE.7b	U1-190

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Unit 2: Linear and Exponential Relationships			
Lesson	Title	Standard(s)	Pages
Lesson 1	Graphs As Solution Sets and Function Notation: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Solving Equations in Standard Form for y	A-CED.4★	U2-3
	Skill 2: Creating Equations from Context	A-CED.2★	U2-16
	Skill 3: Evaluating Negative Exponents	8.EE.1	U2-31
	Skill 4: Substituting Values for Variables*	6.EE.2c	U2-44
	Skill 5: Understanding Domain and Range**	F-IF.1	U2-48
Lesson 2	Solving Linear Inequalities in Two Variables and Systems of Inequalities: Prerequisite Skills		
	Skill 1: Graphing Linear Equations in Two Variables*	A-CED.2★	U2-54
	Skill 2: Verifying Whether Inequalities Are True or False	6.EE.5	U2-60
	Skill 3: Creating Equations from Context*	A-CED.2★	U2-82
Lesson 3	Sequences As Functions: Prerequisite Skills		
	<i>E-Skill 3: Recognizing Patterns</i>	3.OA.9	A-27
	Skill 1: Understanding the Properties of Functions	8.F.4	U2-94
	Skill 2: Understanding Function Notation**	F-IF.2	U2-108
Lesson 4	Interpreting Graphs of Functions: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Graphing Linear Functions from Tables or Equations*	A-CED.2★	U2-113
	Skill 2: Graphing Exponential Functions from Tables or Equations*	A-CED.2★	U2-119
	Skill 3: Understanding Function Notation, Domain, and Independent and Dependent Variables**	F-IF.1	U2-126
	Skill 4: Understanding Slope*	8.EE.5	U2-127
	Skill 5: Interpreting Interval Notation	No standard	U2-134

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Lesson	Title	Standard(s)	Pages
Lesson 5	Analyzing Linear and Exponential Functions: Prerequisite Skills		
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Graphing a Function from a Table of Values*	A-CED.2★	U2-152
	Skill 2: Understanding the Rules of Exponents, Including Negative Exponents*	8.EE.1	U2-160
	Skill 3: Recognizing the General Shape of an Exponential Function (Decay or Growth)*	A-CED.2★	U2-165
Lesson 6	Comparing Functions: Prerequisite Skills		
	Skill 1: Determining the Slope of Linear Functions*	8.EE.5	U2-174
	Skill 2: Determining the Intercepts of Linear Functions	8.EE.6	U2-182
	Skill 3: Determining the Rate of Change of Exponential Functions**	F-IF.6★	U2-198
	Skill 4: Determining the Intercepts of Exponential Functions**	F-IF.4★	U2-199
	Skill 5: Graphing Functions*	A-CED.2★	U2-200
Lesson 7	Building Functions: Prerequisite Skills		
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Evaluating Exponential Expressions*	8.EE.1	U2-210
	Skill 2: Understanding Independent and Dependent Quantities	6.EE.9	U2-215
Lesson 8	Operating on Functions and Transformations: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	Skill 1: Graphing Linear and Exponential Functions*	A-CED.2★	U2-244
	Skill 2: Identifying y -intercepts of Graphs of Functions*	8.EE.6	U2-250
Lesson 9	Arithmetic and Geometric Sequences: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	<i>E-Skill 3: Recognizing Patterns</i>	3.OA.9	A-27
	<i>E-Skill 4: Multiplying Fractions</i>	5.NF.4a	A-34
	Skill 1: Adding and Subtracting Signed Numbers	7.NS.1b 7.NS.1c	U2-263
	Skill 2: Identifying Linear Relationships*	8.F.4	U2-281
	Skill 3: Multiplying Signed Numbers	7.NS.2a	U2-286
Skill 4: Using Exponents*	8.EE.1	U2-298	
Lesson 10	Interpreting Parameters: Prerequisite Skills		
	Skill 1: Graphing Equations*	A-CED.2★	U2-307
	Skill 2: Writing Linear Equations from Context*	A-CED.2★	U2-313
	Skill 3: Writing Exponential Equations from Context*	A-CED.2★	U2-319

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Unit 3: Reasoning with Equations			
Lesson	Title	Standard(s)	Pages
Lesson 1	Solving Equations and Inequalities: Prerequisite Skills		
	<i>E-Skill 1: Applying the Order of Operations</i>	5.OA.1	A-2
	Skill 1: Using the Distributive Property	6.EE.3	U3-3
	Skill 2: Solving Equations*	8.EE.7b	U3-18
	Skill 3: Solving Simple Inequalities	7.EE.4b	U3-25
	Skill 4: Working with Exponents (Raising a Base to a Power)*	6.EE.1	U3-40
	Skill 5: Using Properties of Exponents*	8.EE.1	U3-44
Lesson 2	Solving Systems of Equations: Prerequisite Skills		
	Skill 1: Graphing Equations of Lines*	A–CED.2*	U3-54
	Skill 2: Using Properties of Equality to Solve Equations*	8.EE.7b	U3-60
	Skill 3: Analyzing Situations Involving Linear Equations	8.F.5	U3-65
	Skill 4: Creating Linear Equations to Solve Problems*	A–CED.2*	U3-84

Unit 4: Descriptive Statistics			
Lesson	Title	Standard(s)	Pages
Lesson 1	Working with a Single Measurement Variable: Prerequisite Skills		
	Skill 1: Finding the First and Third Quartiles of a Data Set	6.SP.5c	U4-3
	Skill 2: Plotting Values on a Real Number Line	6.NS.6c	U4-19
	Skill 3: Calculating the Mean and Median of Data	6.SP.5c	U4-34
	Skill 4: Calculating the Mean Absolute Deviation and Interquartile Range of Data	6.SP.5c	U4-46
	Skill 5: Creating Graphical Representations of Data	6.SP.4	U4-65
	Skill 6: Understanding How the Shape of Data Relates to the Center and Spread	6.SP.5d	U4-84

Lesson	Title	Standard(s)	Pages
Lesson 2	Working with Two Categorical and Quantitative Variables: Prerequisite Skills		
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Plotting the Graph of a Linear Function from an Equation*	A-CED.2★	U4-108
	Skill 2: Plotting the Graph of an Exponential Function from an Equation*	A-CED.2★	U4-113
	Skill 3: Evaluating a Function at a Given Input Value**	F-IF.2	U4-120
	Skill 4: Solving a Function for x Given a y -value**	A-CED.4★	U4-121
	Skill 5: Interpreting a Function in Context Using a Graph or an Equation*	8.F.5	U4-122
	Skill 6: Calculating the Vertical Distance Between Two Points on the Coordinate Plane	6.NS.8	U4-127
	Skill 7: Finding the Equation of a Line Using Two Points on the Line*	8.EE.6	U4-141
Skill 8: Relating the Slope and y -intercept of a Line to an Equation in Point-Slope Form*	8.EE.6	U4-148	
Lesson 3	Interpreting Linear Models: Prerequisite Skills		
	Skill 1: Finding a Linear Fit Given a Scatter Plot**	S-ID.6c★	U4-159
	Skill 2: Connecting Graphs and Equations of Linear Functions	8.F.3	U4-160
	Skill 3: Determining the Slope and y -intercept of a Linear Function Given a Graph or an Equation*	8.F.4	U4-178
	Skill 4: Creating a Scatter Plot Given Data in a Table	8.SP.1	U4-184
	Skill 5: Identifying Linear Correlations Graphically	8.SP.3	U4-204
Skill 6: Examining Linear Correlations Using the Correlation Coefficient, r **	S-ID.8★	U4-226	

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Unit 5: Congruence, Proof, and Constructions			
Lesson	Title	Standard(s)	Pages
Lesson 1	Introducing Transformations: Prerequisite Skills		
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Understanding the Undefined Terms in Geometry: <i>Point, Line, and Plane**</i>	G-CO.1	U5-2
	Skill 2: Understanding that the Interior Angles of a Triangle Total 180°	7.G.2	U5-3
Lesson 2	Defining and Applying Rotations, Reflections, and Translations: Prerequisite Skills		
	<i>E-Skill 2: Understanding the Coordinate Plane</i>	5.G.1	A-10
	Skill 1: Understanding the Definitions of Basic Transformations	8.G.3	U5-19
Lesson 3	Constructing Lines, Segments, and Angles: Prerequisite Skills		
	Skill 1: Understanding the Geometry Terms <i>Line, Segment, Ray, and Angle**</i>	G-CO.1	U5-40
	Skill 2: Copying Angles and Segments**	G-CO.12	U5-41
	Skill 3: Bisecting Line Segments**	G-CO.12	U5-42
Lesson 4	Constructing Polygons: Prerequisite Skills		
	Skill 1: Copying and Bisecting Line Segments**	G-CO.12	U5-46
	Skill 2: Constructing Perpendicular Lines**	G-CO.12	U5-47
Lesson 5	Exploring Congruence: Prerequisite Skills		
	Skill 1: Constructing Perpendicular Bisectors**	G-CO.12	U5-52
	Skill 2: Copying a Segment**	G-CO.12	U5-53
	Skill 3: Copying an Angle**	G-CO.12	U5-54
	Skill 4: Recognizing Rotations, Reflections, and Translations*	8.G.3	U5-55
	Skill 5: Setting Up Ratios	6.RP.1	U5-59
	Skill 6: Using the Pythagorean Theorem	8.G.7	U5-76
Lesson 6	Congruent Triangles: Prerequisite Skills		
	Skill 1: Recognizing Transformations**	G-CO.2	U5-94
	Skill 2: Identifying Corresponding Pairs of Sides and Angles	No standard	U5-95

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Unit 6: Connecting Algebra and Geometry Through Coordinates			
Lesson	Title	Standard(s)	Pages
Lesson 1	Slope and Distance: Prerequisite Skills		
	Skill 1: Calculating Slope*	8.EE.5	U6-2
	Skill 2: Writing Linear Equations*	8.F.4	U6-8
	Skill 3: Using the Pythagorean Theorem*	8.G.7	U6-15
	Skill 4: Graphing Linear Equations*	8.F.3	U6-19
Lesson 2	Lines and Line Segments: Prerequisite Skills		
	Skill 1: Using the Distance Formula with Two Points on the Coordinate Plane	8.G.8	U6-29
	Skill 2: Calculating the Perimeter of Polygons	No standard	U6-53
	Skill 3: Calculating the Areas of Triangles and Rectangles	6.G.1	U6-66
	Skill 4: Simplifying Radicals	No standard	U6-80