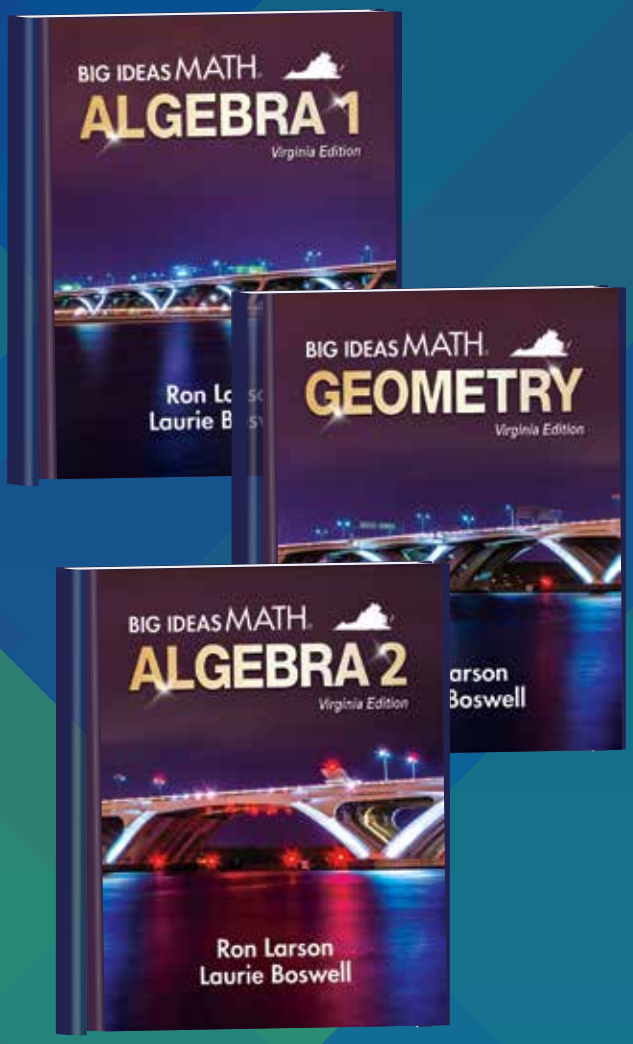
BIG IDEAS MATH®

VIRGINIA EDITION

Ron Larson | Laurie Boswell



NGL.Cengage.com/Virginia

BIG IDEAS LEARNING®

High School

NATIONAL GEOGRAPHIC LEARNING | CENGAGE

Empower Learning with *Big Ideas Math*

Big Ideas Learning® is pleased to offer a complete high school program built for Virginia students — ***Big Ideas Math®: Virginia Edition — Algebra 1, Geometry,*** and ***Algebra 2***. Ron Larson and Laurie Boswell's research-based program is aligned to the Virginia Standards of Learning (SOL) and provides a rigorous, focused, and coherent curriculum for high school students.

Create Confident Learners With:

- Dynamic Technology for the 21st-Century Classroom
- Complete Support for Teachers in Lesson Planning and Lesson Presentation
- Dynamic Assessment System
- Research-Based Content and Delivery
- Rigorous, Focused, and Coherent Curriculum
- Balanced Approach to Instruction
- Continuous Preparation for High-Stakes Assessment
- Embedded RTI, Differentiated Instruction, and ELL Support

LOXODONTA AFRICANA

African Elephant

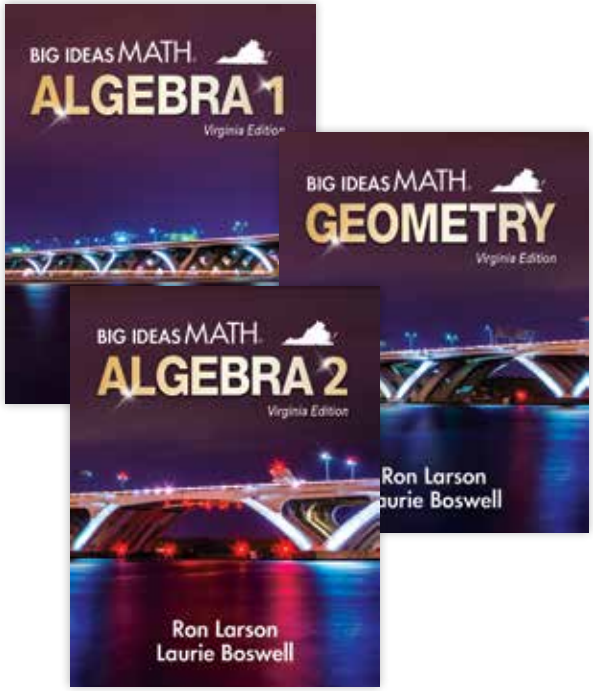
COVER: One species of African elephant, the bush elephant, is the largest living terrestrial animal, while the forest elephant is the third-largest. African elephants are found widely in Sub-Saharan Africa, in dense forests, mopane and miombo woodlands, Sahelian scrub, or deserts. The trunk acts as a fifth limb, a sound amplifier, and an important method of touch.

http://www.nationalgeographic.com/animals/mammals/a/african-elephant/

PHOTO CREDIT: Codyphotography / iStock by Getty Images

Expert Authors

The ***Big Ideas Math*** authors are dedicated to fostering curiosity and confidence in learners.



We created Big Ideas Math because we recognized the need for a truly balanced approach to learning, using discovery learning and scaffolded instruction.

—Ron Larson, Ph.D.

Big Ideas Math encourages productive struggle. It's not about being hard. The entire program is accessible for all students.

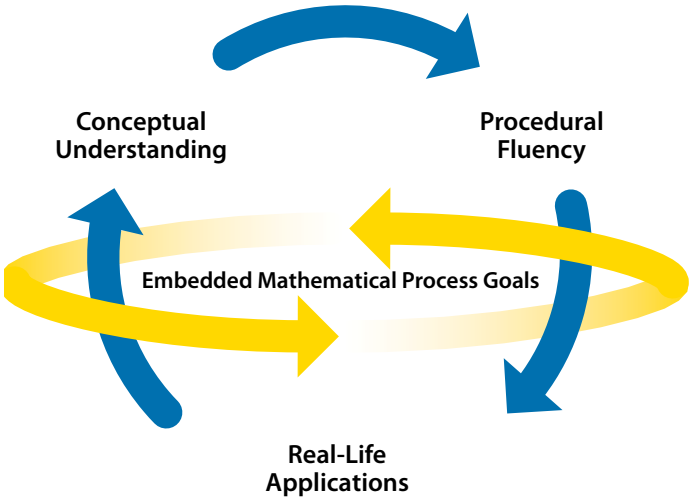
—Laurie Boswell, Ed.D.

Dr. Larson and Dr. Boswell began writing together in 1992. Since that time, they have authored over three dozen textbooks. In their collaboration, Ron is primarily responsible for the Student Edition while Laurie is primarily responsible for the Teaching Edition.

Ron Larson, Ph.D., is well known as the lead author of a comprehensive program for mathematics that spans middle school, high school, and college courses. He holds the distinction of Professor Emeritus from Penn State Erie, The Behrend College, where he taught for nearly 40 years. He received his Ph.D. in mathematics from the University of Colorado. Dr. Larson's numerous professional activities keep him actively involved in the mathematics education community and allow him to fully understand the needs of students, teachers, supervisors, and administrators.

Laurie Boswell, Ed.D., is the former Head of School at Riverside School in Lyndonville, Vermont. In addition to textbook authoring, she provides mathematics consulting and embedded coaching sessions. Dr. Boswell received her Ed.D. from the University of Vermont in 2010. She is a recipient of the Presidential Award for Excellence in Mathematics Teaching and is a Tandy Technology Scholar. Laurie has taught math to students at all levels, elementary through college. In addition, Laurie has served on the NCTM Board of Directors and as a Regional Director for NCSM. Along with Ron, Laurie has co-authored numerous math programs and has become a popular national speaker.

Program Philosophy: Rigor and Balance with Embedded Mathematical Process Goals



The ***Big Ideas Math*** program balances conceptual understanding with procedural fluency. Real-life applications create connections to content and help turn mathematical learning into an engaging and meaningful way to explore the real world.

Embedded ***Mathematical Process Goals*** in grade-level content promote a greater understanding of how mathematical concepts are connected to each other and to real-life scenarios.

Mathematical Processes

Mathematically proficient students carefully specify units of measure.

UNDERSTANDING MATHEMATICAL TERMS

A **conjecture** is an unproven statement about a general mathematical concept. After the statement is proven, it is called a **rule** or a **theorem**.

1.4 Solving Simple Equations

Essential Question How can you use simple equations to solve real-life problems?

EXPLORATION 1 **Measuring Angles**

Work with a partner. Use a protractor to measure the angles of each quadrilateral. Copy and complete the table to organize your results. (The notation $m\angle A$ denotes the measure of angle A.) How precise are your measurements?

a. b. c.

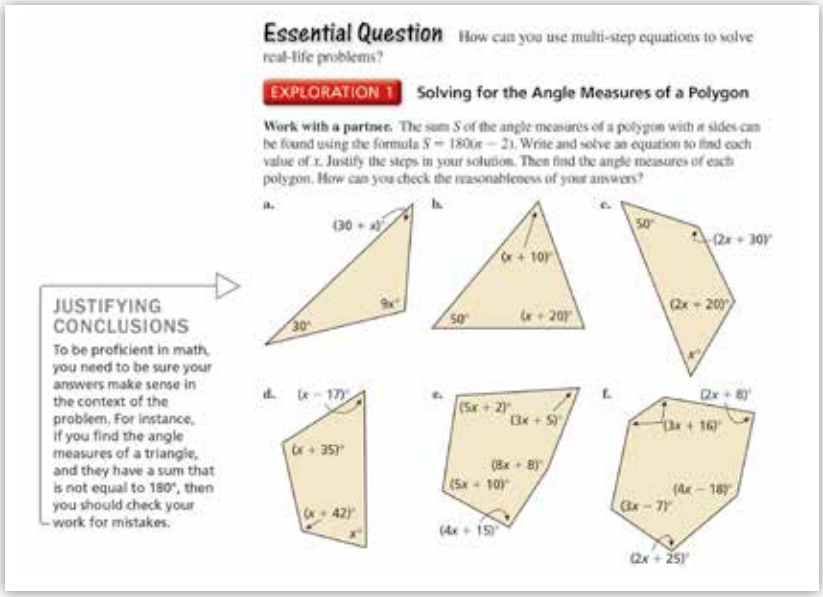
Quadrilateral	$m\angle A$ (degrees)	$m\angle B$ (degrees)	$m\angle C$ (degrees)	$m\angle D$ (degrees)	$m\angle A + m\angle B + m\angle C + m\angle D$
a.					
b.					
c.					

EXPLORATION 2 **Making a Conjecture**

Work with a partner. Use the completed table in Exploration 1 to write a conjecture about the sum of the angle measures of a quadrilateral. Draw three quadrilaterals that are different from those in Exploration 1 and use them to justify your conjecture.

"In writing the Activities and Explorations, I wanted to provide ALL students with the opportunity to start them with some success."

—Ron Larson, Ph.D.



Essential Question How can you use multi-step equations to solve real-life problems?

EXPLORATION 1 Solving for the Angle Measures of a Polygon

Work with a partner. The sum S of the angle measures of a polygon with n sides can be found using the formula $S = 180(n - 2)$. Write and solve an equation to find each value of x. Justify the steps in your solution. Then find the angle measures of each polygon. How can you check the reasonableness of your answers?

a. $(30 + x)°$, $9x°$, $30°$

b. $(x + 10)°$, $50°$, $(x + 20)°$

c. $50°$, $(2x + 30)°$, $(2x + 20)°$, $x°$

d. $(x - 17)°$, $(x + 35)°$, $(x + 42)°$, $x°$

e. $(5x + 2)°$, $(3x + 5)°$, $(8x + 8)°$, $(5x + 10)°$, $(4x + 15)°$

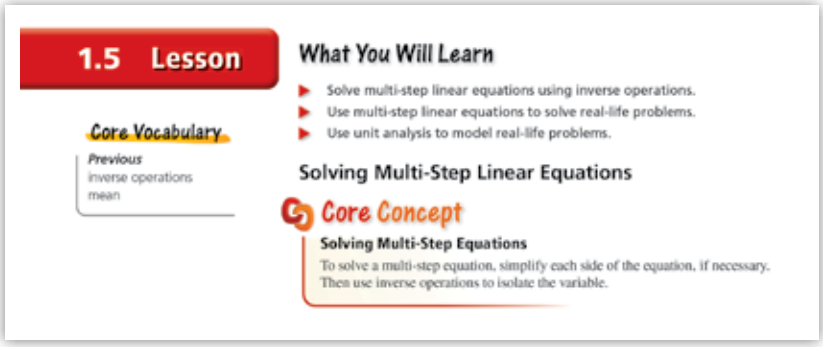
f. $(2x + 8)°$, $(3x + 16)°$, $(4x - 18)°$, $(3x - 7)°$, $(2x + 25)°$

JUSTIFYING CONCLUSIONS

To be proficient in math, you need to be sure your answers make sense in the context of the problem. For instance, if you find the angle measures of a triangle, and they have a sum that is not equal to 180°, then you should check your work for mistakes.

Conceptual Understanding

Explorations and guiding Essential Questions encourage ***conceptual understanding***.



1.5 Lesson

What You Will Learn

- Solve multi-step linear equations using inverse operations.
- Use multi-step linear equations to solve real-life problems.
- Use unit analysis to model real-life problems.

Core Vocabulary

Previous
inverse operations
mean

Solving Multi-Step Linear Equations

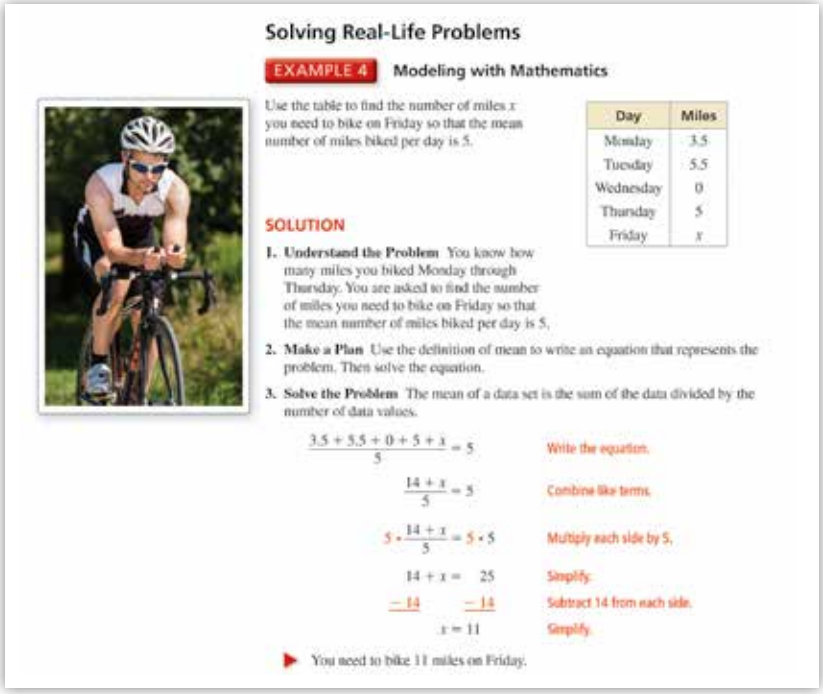
Core Concept

Solving Multi-Step Equations

To solve a multi-step equation, simplify each side of the equation, if necessary. Then use inverse operations to isolate the variable.

Procedural Fluency

Scaffolded lessons allow for ***procedural fluency*** and provide the opportunity to use clear, precise mathematical language.



Solving Real-Life Problems

EXAMPLE 4 Modeling with Mathematics

Use the table to find the number of miles x you need to bike on Friday so that the mean number of miles biked per day is 5.

Day	Miles
Monday	3.5
Tuesday	5.5
Wednesday	0
Thursday	5
Friday	x

SOLUTION

1. **Understand the Problem** You know how many miles you biked Monday through Thursday. You are asked to find the number of miles you need to bike on Friday so that the mean number of miles biked per day is 5.
2. **Make a Plan** Use the definition of mean to write an equation that represents the problem. Then solve the equation.
3. **Solve the Problem** The mean of a data set is the sum of the data divided by the number of data values.

$\frac{3.5 + 5.5 + 0 + 5 + x}{5} = 5$ Write the equation.

$\frac{14 + x}{5} = 5$ Combine like terms.

$5 \cdot \frac{14 + x}{5} = 5 \cdot 5$ Multiply each side by 5.

$14 + x = 25$ Simplify.

$-14 \quad -14$ Subtract 14 from each side.

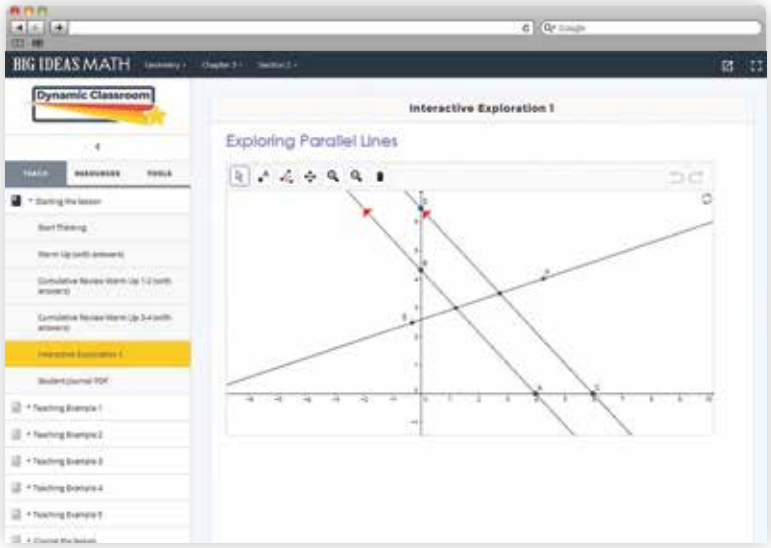
$x = 11$ Simplify.

▶ You need to bike 11 miles on Friday.

Real-Life Applications

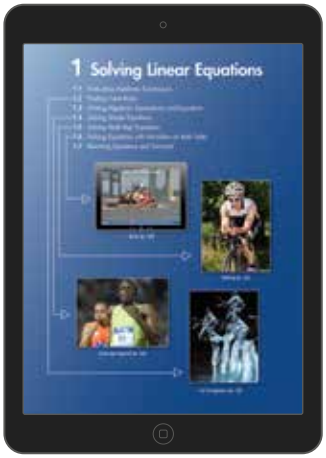
Real-life applications provide students with opportunities to create connections between classroom lessons and realistic scenarios.

Ignite Learning with Dynamic Technology



Dynamic Classroom

The ***Dynamic Classroom*** is a digital lesson presentation tool built to engage students. Teachers can progress through each lesson from opening to closing with one simple click. The ***Dynamic Classroom*** includes daily lesson resources like the ***Dynamic Investigations*** and Student Workbook, as well as a variety of interactive teaching tools.



Student Dynamic eBook

The ***Student Dynamic eBook*** is a complete electronic version of the Student Edition that includes interactive digital resources. The eBook allows students to navigate through the textbook, highlight important information, and add notes or bookmarks. While this eBook is available off-line, with a data or internet connection, students can access embedded, digital enhancements.

Audio available in English and Spanish

Dynamic Investigations

The ***Dynamic Investigations*** in the ***Big Ideas Math*** program allow students and teachers to interactively complete the ***Big Ideas Math*** explorations.

CREATE CONNECTIONS THROUGH EXPLORATION!

Real-Life STEM Videos

Every chapter in the ***Big Ideas Math*** program contains a ***Real-Life STEM Video*** allowing students to further engage with mathematical concepts. Students learn about the Parthenon, natural disasters, solar power, and more!

ENCOURAGE CURIOSITY WITH STEM CONCEPTS!

QUICKLY REVIEW HOMEWORK!

Answer Presentation Tool

The tedious process of going over homework can now become quick and convenient with the ***Answer Presentation Tool*** so teachers can target their instruction where needed, reaching the students who need help the most. Teachers can display answers to select exercises, including odds, evens, or any combination of exercises. Then with a single click, the worked-out solution appears, showing students how to arrive at the answer. Take this tool to the next level by having students explain the displayed solutions to students who need help or by opening up discussion around multiple ways to solve problems!

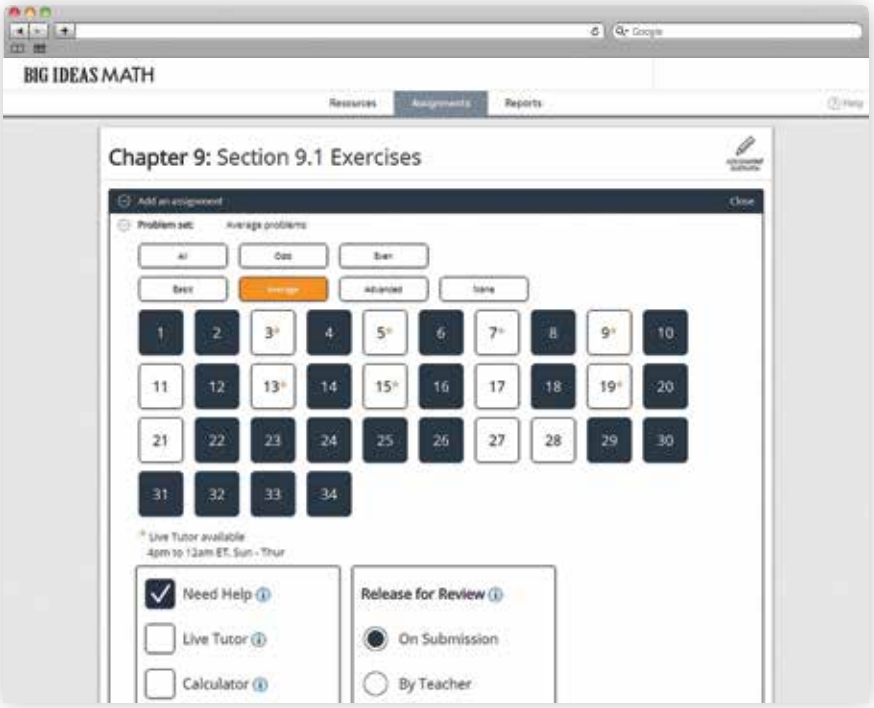
Dynamic Assessment System

The ***Dynamic Assessment System*** allows teachers to track and evaluate their students' advancement through the curriculum. Developed exclusively for ***Big Ideas Math***, this technology provides teachers and students an intuitive and state-of-the-art tool to help students effectively learn mathematics. Built for ease of use, the tool is available on a wide range of devices.

The *Big Ideas Math* Dynamic Assessment System

Homework and Assessment That Informs

- Includes multiple, customizable assignments for each chapter
- Assign homework and assessments for the entire class or a select group of students
- Offers progress monitoring assessments for an adaptive testing experience



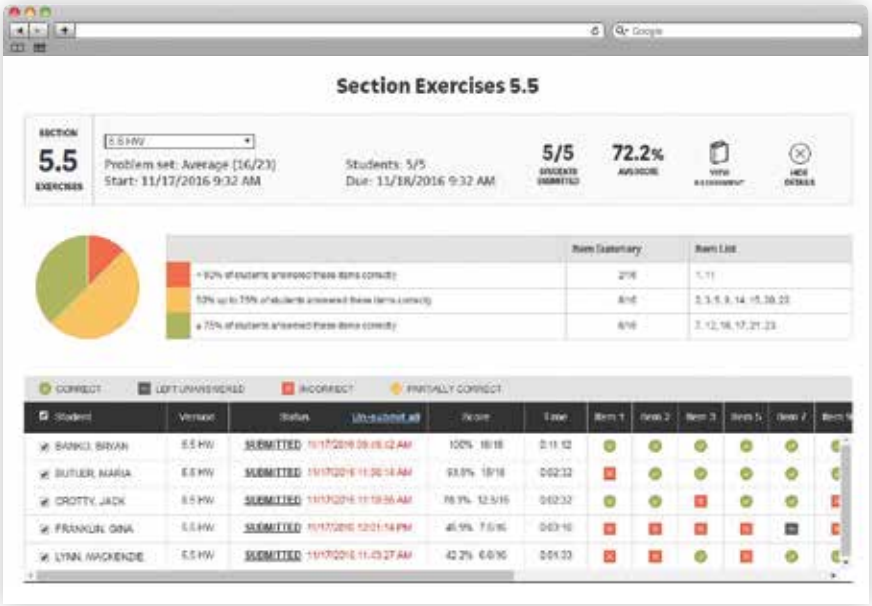
RESTORE STUDENT CONFIDENCE!

Direct Ties to Remediation

- Includes direct links to Lesson Tutorial Videos and relevant lesson sections
- Allows students to access live chat tutors for selected exercises

Assessment Reporting with Precision

- Offers real-time reporting at both the class and student levels
- Tracks progress through Assignment Performance, Remediation, and Standards reports

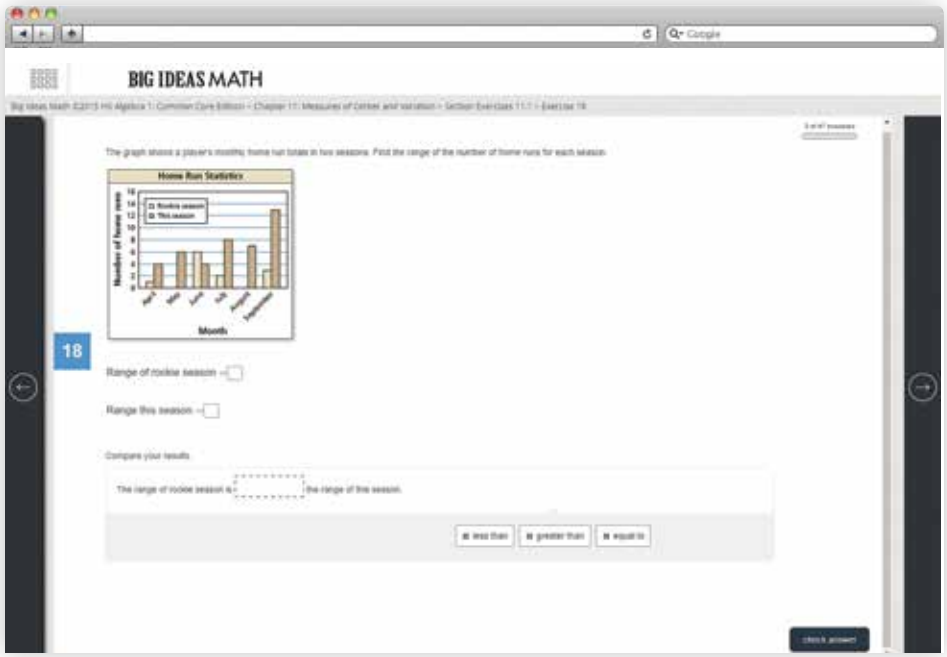


Formative practice has to have feedback and action. Use assessments to drive instructional decisions.

—Laurie Boswell, Ed. D.

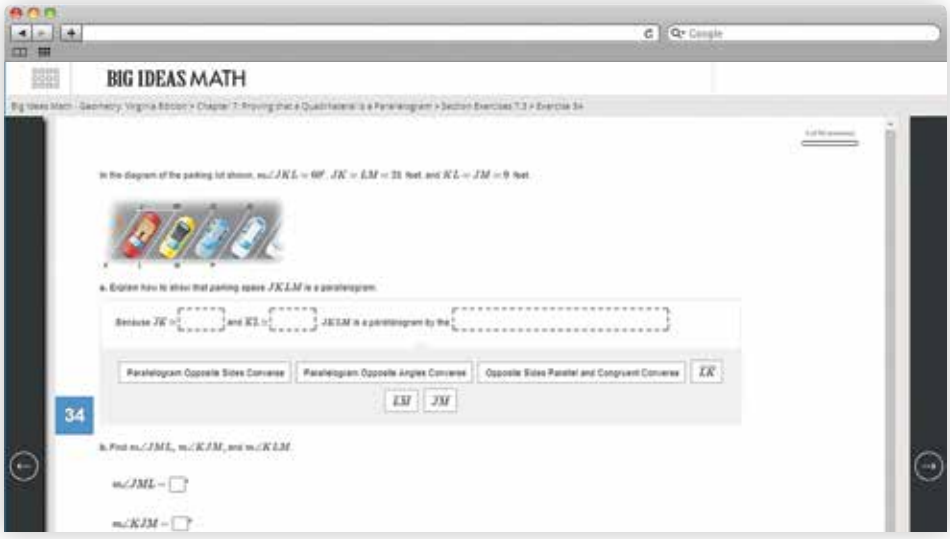
Assessment Delivery

- Provides embedded tools for students
- Includes auto-scored, technology-enhanced items such as drag and drop, graphing, point plotting, multiple select, and fill in the blank using math expressions
- Allows teachers to include reminders or notes to students



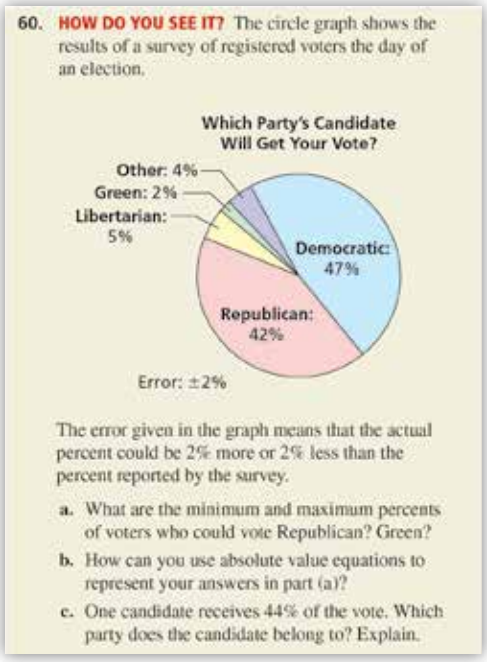
Intuitive Design

- Operates on a wide range of devices with large and clear icons for visibility
- Allows for multiple reporting views through toggle options
- Includes intelligent presets and easy navigation



Preparation for the Journey Toward High-Stakes Testing

Each chapter of the ***Big Ideas Math*** program features question types frequently found on standardized tests. The balanced approach to instruction also helps students develop the habits of mind required to be successful on SOL tests.



60. **HOW DO YOU SEE IT?** The circle graph shows the results of a survey of registered voters the day of an election.

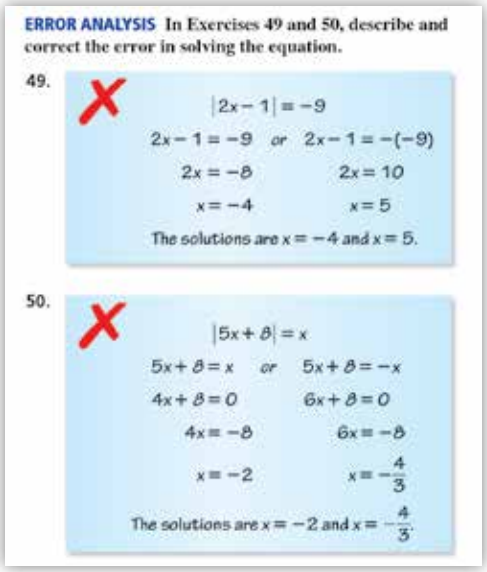
The error given in the graph means that the actual percent could be 2% more or 2% less than the percent reported by the survey.

a. What are the minimum and maximum percents of voters who could vote Republican? Green?

b. How can you use absolute value equations to represent your answers in part (a)?

c. One candidate receives 44% of the vote. Which party does the candidate belong to? Explain.

41. **MAKING AN ARGUMENT** Your friend claims that Thermometer A displays a greater temperature than Thermometer B. Is your friend correct? Explain your reasoning.



ERROR ANALYSIS **In Exercises 49 and 50, describe and correct the error in solving the equation.**

49.

$$|2x - 1| = -9$$

$$2x - 1 = -9 \quad \text{or} \quad 2x - 1 = -(-9)$$

$$2x = -8 \qquad 2x = 10$$

$$x = -4 \qquad x = 5$$

The solutions are $x = -4$ and $x = 5$.

50.

$$|5x + 8| = x$$

$$5x + 8 = x \quad \text{or} \quad 5x + 8 = -x$$

$$4x + 8 = 0 \qquad 6x + 8 = 0$$

$$4x = -8 \qquad 6x = -8$$

$$x = -2 \qquad x = -\frac{4}{3}$$

The solutions are $x = -2$ and $x = -\frac{4}{3}$.

Exercises

The Exercises in the ***Big Ideas Math*** program provide students with opportunities to use multiple approaches to solve problems.

Dynamic Assessment System

This tool allows teachers to provide customizable homework directly related to the ***Big Ideas Math*** program. Assignments are automatically scored and students have access to immediate remediation on homework questions.

Explorations

The Explorations that begin each section require students to use higher-level thinking to work through each problem and to explain their reasoning in the solution.

Cumulative Assessments

The quarterly Cumulative Assessments in the Assessment Book contain questions that were carefully chosen to represent problem types and reasoning patterns frequently found on standardized tests.

Quizzes and Tests

The Quizzes and Tests in the Assessment Book assess the concepts students learned in each lesson.

Performance Tasks

Each chapter of the ***Big Ideas Math*** program contains a Performance Task in the Assessment Book that correlates to the STEM video of the chapter. Each Performance Task allows students to work with multiple standards.

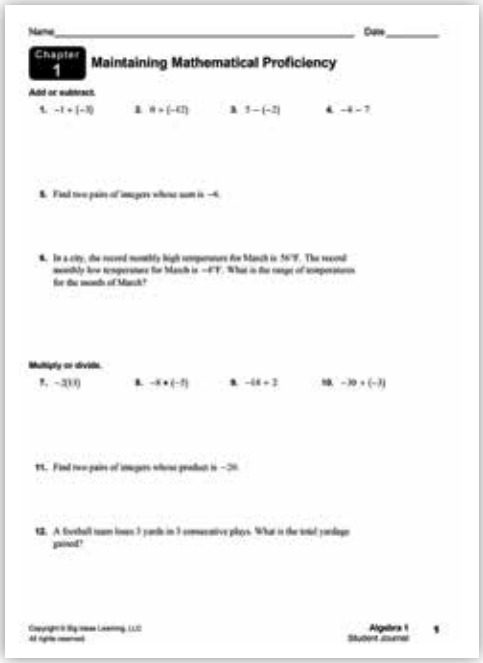
Robust Print Support for All Learners

Virginia Student Edition

The Virginia Student Edition was designed using the Universal Design for Learning Guidelines (CAST © 2011) and features carefully chosen images that increase student engagement and enhance the mathematical content.

Virginia Teaching Edition

The Virginia Teaching Edition provides teachers with complete support for every ***Big Ideas Math*** lesson. Master educator Laurie Boswell incorporates instructional insights and recommendations in Laurie's Notes.



Student Workbook

This consumable workbook serves as a valuable resource where students can solve extra practice problems, take notes, and internalize new concepts by expressing their findings in their own words.

Assessment Book

- Mid-Chapter Quizzes
- Chapter Tests
- Performance Tasks
- Quarterly Cumulative Tests
- Pre-Course Test with Item Analysis
- Post Course Test with Item Analysis

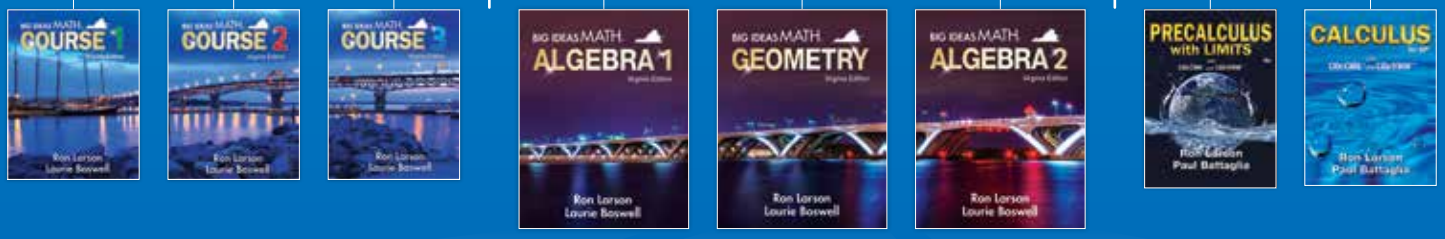
Online Resources

- Warm Up
- Enrichment and Extension
- Puzzle Time
- Differentiating the Lesson
- Skills Review Handbook
- ExamView®

CONVENIENTLY ACCESS ALL VIRGINIA PRINT COMPONENTS ONLINE AT *BIGIDEASMATH.COM*!

Count on us for your Larson solutions from Grade 6 through AP®

MIDDLE SCHOOL | HIGH SCHOOL | PRECALCULUS/AP® CALCULUS



Algebra 1

CHAPTERS

1 Solving Linear Equations
2 Solving Linear Inequalities
3 Functions
4 Graphing Linear Equations
5 Writing Linear Equations
6 Solving Systems of Linear Equations
7 Polynomials
8 Factoring Polynomials
9 Graphing Quadratic Functions
10 Solving Quadratic Equations

Geometry

CHAPTERS

1 Basics of Geometry
2 Reasoning and Proofs
3 Parallel and Perpendicular Lines
4 Transformations
5 Congruent Triangles
6 Relationships Within Triangles
7 Quadrilaterals and Other Polygons
8 Similarity
9 Right Triangles and Trigonometry
10 Circles
11 Circumference, Area, and Surface Area
12 Volume

Algebra 2

CHAPTERS

1 Linear Functions
2 Quadratic Functions
3 Quadratic Equations and Complex Numbers
4 Polynomial Functions
5 Rational Exponents and Radical Functions
6 Exponential and Logarithmic Functions
7 Rational Functions
8 Sequences and Series
9 Probability and Statistics

Connect with us!

NGL.Cengage.com/BigIdeas

@natgeolearning
@ExploreInside
@natgeolearning

BigIdeasLearning.com

@BigIdeasLearning
@BigIdeasMath
@BigIdeasMath

NGL.Cengage.com/Virginia

Contact your Virginia Sales Consultant team for more information!

Milton Pierce
Mid-Atlantic Regional Manager
milton.pierce@cengage.com
(540) 718-0334

Joe Piazza
Math Engagement Consultant
joseph.piazza@cengage.com
(443) 686-0570

Lisa Williams
Big Ideas Learning Consultant
lisawilliams@larsontexts.com
(814) 823-5207

NATIONAL GEOGRAPHIC LEARNING | CENGAGE

BIG IDEAS LEARNING®

888-915-3276

ISBN-13: 978-13378-66194
ISBN-10: 13378-66199
90000
9 781337 866194
OCT/17