

Mathematical Foundations Workbook

Student Update Sheet

for the Earlier Kendall Hunt Printing

This document contains the substantive revisions incorporated into the July 2026 reprint of the *Mathematical Foundations Workbook*. Students using the earlier Kendall Hunt printing should make the following updates while working through the workbook.

Only substantive mathematical or instructional revisions are listed. Typographical and formatting corrections are omitted.

Workbook Page 4

The Foundations of Mathematical Learning

After the sentence ending

more accurate and formal mathematical understanding.

insert

The workbook reviews foundational ideas and gradually formalizes them using mathematical language and notation.

Workbook Page 6

Launch Exploration: Grouping and Regrouping

At the end of the activity, insert

Reflection: Describe your grouping strategy and explain how it helped you determine the total quantity.

Workbook Page 7

Section 1.1.1, Opening Questions

After

Describe the set of counting numbers. What are the natural numbers? What are the whole numbers?

insert

Conventions vary regarding whether 0 is included in the natural numbers.

Example 1.1

After the instruction

Write 70345601 in words.

insert

Why do legal and financial documents often write amounts in both words and numerals?
What problem does this help prevent?

Workbook Page 10

Example 1.4

After completing parts (a) and (b), insert

Reflection: How much information is lost when rounding at each level?

Rounding Rules: Rounding Up

Replace

If the next lower-level digit is ≥ 5 we increase the digit at the level of rounding by one unit, regroup the higher-level digits if necessary, and change all lower-level digits zero.

with

If the next lower-level digit is ≥ 5 we increase the digit at the level of rounding by one unit, regroup the higher-level digits if necessary, and change all lower-level digits to zero.

Workbook Page 12

Place Value Merry-Go-Round

At the end of the activity, insert

This activity reinforces numeration, translation, and rounding skills.

Workbook Page 13

Exercise 11

Replace

Explain why, in any number, the unit of a given order represents a value greater than the number formed by all the digits to its right.

with

Explain why, in any number, the unit of a given order represents a value greater than the number formed by all the digits to its right. Use an example to support your explanation.

Workbook Page 14

Section 1.1.4, Opening Question

After

Explain how numbers are represented on a number line.

insert

What does the spacing between marks represent?

Example 1.9

Replace

Draw and mark the numbers 20 and 30 on a number line. Using tick marks, plot the number 25.

with

Draw and mark the numbers 20 and 30 on a number line. Using equal tick marks, plot the number 25.

Workbook Page 15

Section 1.2.1, Opening Questions

Replace

Define when two numbers are alike.

with

Define when two concrete numbers are alike.

Replace

State The Fundamental Principle of Addition (and Subtraction) in your own words.

with

State The Fundamental Principle of Addition in your own words.

Workbook Page 16

Example 1.11

Replace part (a)

Draw a labeled number line to represent the situation.

with

Draw a labeled number line to represent the situation. Label the number line using an appropriate unit.

Workbook Page 17

Example 1.12

In the list of subtraction problems, change the label on the final problem from “4)” to “d)”.

Number Line Representation of Subtraction

Replace

Formulate a Fundamental Principle of Subtraction.

with

Formulate a Fundamental Principle of Subtraction. Compare with the Addition Principle.

Workbook Page 21

Exercises

Delete the exercise number before

Use the addition and subtraction algorithms to find the sums and differences. Verify subtractions by using addition.

Renumber the three exercises that follow as 10, 11, and 12.

Workbook Page 22

Section 1.2.3, Opening Question

Replace

What are the integers? Define the absolute value or modulus of an integer.

with

What are the integers? Define the absolute value or modulus of an integer. “Absolute value” is the more common term.

Example 1.17

Replace “net asset” with “net worth.”

Workbook Page 23

Section 1.2.4, Opening Questions

Replace

Define the negation or taking the opposite of an integer? State the rule of double negation.

with

Define negation or taking the opposite of an integer. Give examples.

State the rule of double negation:

Workbook Page 24

Exercise 24

Replace “net asset” with “net worth,” and describe the representation as an “O-X (chip) model.”

Workbook Page 27

Examples 1.20–1.21

After Example 1.21, insert

Reflection: Compare the two representations.

Workbook Page 29

Number Line Representation of Division

Label the two division interpretations

(measurement division)

(partitive division)

Workbook Page 35

Commutativity

Replace

Are subtraction and division commutative? Give examples that show that they are or are not associative.

with

Are subtraction and division commutative? Give examples that show that they are or are not commutative.

Workbook Page 36

Distributivity

After the instruction referring to the array diagram, insert

Describe how rows and columns of the array relate to the expression.

Workbook Page 38

Section 1.3.5, Opening Questions

Replace

Include an explanation of the role of parentheses.

with

Include an explanation of the role of parentheses and distinguish negation from subtraction in the discussion of the order of operations.

Workbook Page 41

Section 1.3.6, Opening Text

After

To apply mathematical knowledge to real world situations, we translate verbal descriptions into numerical expressions and evaluate them.

insert

Translation is the bridge between verbal reasoning and algebraic notation.

Workbook Page 42

Exercises

After the exercise involving quantities with different units, insert

Discuss whether subtracting quantities with different units is meaningful and how the question should be interpreted.

After the exercise ending with “reasoning,” insert

Can you represent the situation algebraically?

Workbook Page 43

Example 1.27

Replace

List all the natural-number divisors for each of the first 12 natural numbers.

with

List all the natural-number divisors for each of the first 12 natural numbers and 0.
Discuss how the divisors of 0 are treated.

After the list, insert

In the list above, identify numbers with exactly two divisors:

Workbook Page 44

Multiples

Replace

List the first 10 multiples for the first 12 natural numbers.

with

List the first 10 multiples for the first 12 natural numbers and 0. What can you say about the multiples of 0?

Workbook Page 45

Exercises

In Exercises 2 and 3, respectively, add the instruction

Justify your answer using the definition of divisibility.

and add

Connect your answer to the multiplicative property of zero.

Workbook Page 48

Exercise 13

Replace the final instruction with

Justify your answer based on the definition of a prime number.

Workbook Page 50

Section 1.4.3, Opening Question

Replace

State the divisibility criteria for 2, 3, 4, 5, 9, 10, and 25.

with

State the divisibility criteria for 2, 3, 4, 5, 9, 10, and 25. Test each criterion with examples and nonexamples.

Workbook Page 52

Section 1.4.4, Opening Question

Replace

Given two integers a and $b > 0$, describe the quotient q and remainder r of division of a by b . Are the two unique?

with

Given two integers a and $b > 0$, describe the quotient q and remainder r when a is divided by b .

Is the pair (q, r) unique? In other words, is there only one possible quotient-remainder pair or could another pair work?

Why must the remainder satisfy $0 \leq r < b$?

Workbook Page 54

Section 1.4.5, Mental Math

Insert

Different students may prefer different mental-math approaches, but all students should be familiar with the basic strategies.

Workbook Page 55

Mental-Math Strategies

Add the labels

(doubling-and-halving)

(scaling)

(estimation)

(count-up subtraction)

to the corresponding mental-math strategies.

Workbook Page 56

Exercises

Replace part (b)

$$583 + 198$$

with

$$742 + 398.$$

Workbook Page 59

Section 2.1.1, Opening Text

Insert

The meaning of a fraction depends on the chosen whole.

Workbook Page 62

Section 2.1.2, Opening Questions

Replace

Describe the area model representation of a fraction.

with

Describe the area model representation of a fraction. Give examples.

Explain what all representations have in common.

Workbook Page 63

Area-Model Discussion

Insert

We assume that the diamonds are identical. Changing the whole changes the value represented by the same shaded region.

Workbook Page 66

Equivalent Fractions

Insert

Note: Prime factorization guarantees uniqueness of the irreducible form.

Also insert

Reflection: How do you connect these rules to the sign rules for integers?

Workbook Page 67

Equivalent Fractions

Replace

Verify equivalence using cross multiplication.

with

Verify equivalence using cross multiplication. Cross multiplication assumes the fractions are defined.

Workbook Page 72

Comparing Fractions

Insert

Note: Another common benchmark is $\frac{1}{2}$.

Workbook Page 74

Exercise

Replace the question ending

On which day was the greatest distance?

with

On which day was the greatest distance traveled? Justify your answer.

Workbook Page 77

Fraction Operations

Insert

Reflection: Identify whether your estimate was based on benchmarks, signs, or magnitude.

Workbook Page 81

Division of Fractions

Insert

Reflection: Compare the units in the two interpretations.

Also insert

Verify the result using multiplication.

Workbook Page 87

Exercises

For the two class-size problems, append

Consider area-model reasoning before symbolic equations.

Workbook Page 91

Order of Operations with Fractions

Insert

Reflection: Explain why the rules are necessary for unambiguous communication.

Workbook Page 95

Section 2.3.1

Insert

Note: Terminal decimals are a subset of rational numbers.

Workbook Page 96

Repeating Decimals

Insert

Reflection: Discuss why the repetition must eventually occur.

Workbook Page 101

Rounding Decimal Fractions

In both rounding rules, replace “change all lower-level digits zero” with “change all lower-level digits to zero.”

Workbook Page 103

Operations with Decimal Fractions

Replace

Summarize the rules for multiplying and dividing by powers of 10. Give your own examples.

with

Summarize the rules for multiplying and dividing a decimal number by powers of 10. Give your own examples.

Workbook Page 105

Ratios and Proportions

Insert

Note: Ratios compare quantities and not necessarily numbers with the same units.

Workbook Page 107

Proportional Reasoning

Insert

Reflection: Connect the solution to equivalent-fraction reasoning from Chapter 2.1.

Workbook Page 109

Double Number Line

Replace

Identify the ratio and represent it using a double number line.

with

Identify the ratio and represent it using a double number line. Include units.

Workbook Page 118

Exercise 10

Replace

A map with a scale of 1cm : 800,000 km is considered.

with

A map with a scale of 1cm : 800,000 cm is considered.

Workbook Page 119

Direct and Inverse Proportionality

Insert

Reflection: Contrast direct and inverse proportionality.

Workbook Page 120

Exercise

After the question

How long will it take the remaining workers to finish the job?

insert

Draw a timeline or work-rate model.

Workbook Page 122

Percent Representations

Insert

Note: Percents greater than 100% are possible and meaningful.

Workbook Page 131

Percent Problems

Insert

Reflection: Are two successive 20% increases equivalent to a single 40% increase?

Workbook Page 132

Exercise 33

Replace

The price of a television increased by 10%, then decreased by 20%, ending at \$1056.
Determine the original price of the television.

with

A jacket was discounted by 20% and then marked up by 10%. The final price was \$528.
Find the original price.

Workbook Page 136

Launch Exploration: Mystery Number Games

At the end of the activity, insert

Reflection: What do all four tricks have in common?

Workbook Page 138

Exponents

Replace

(You may use a calculator)

with

(You may use a calculator after you estimate the answer and identify the power of 2 involved.)

Workbook Page 141

Exercise

After the question asking whether the resulting length or the pencil is longer, insert

Estimate the result before calculating.

Workbook Page 142

Example 3.4

Replace

Use the rules of exponents to show that $b^0 = 1$ when $b \neq 0$.

with

Use the quotient rule for exponents to show that $b^0 = 1$ when $b \neq 0$.

Workbook Page 143

Exponents

Insert

Reflection: Discuss how to expand the power and use the order of operations.

Workbook Page 151

Irrational Numbers

Replace

Examples of irrational numbers: $\sqrt{2} \approx 2.414\dots$, $\sqrt{3} \approx 2.732\dots$, $\sqrt{5} \approx 1.709\dots$

with

Examples of irrational numbers: $\sqrt{2} \approx 1.414\dots$, $\sqrt{3} \approx 1.732\dots$, $\sqrt[3]{5} \approx 1.709\dots$ (non-terminating, non-repeating decimal expansions)

Workbook Page 152

Real and Imaginary Numbers

Insert

Note: This extension preserves algebraic consistency.

Workbook Page 153

Logarithms

Insert

Reflection: What question does a logarithm answer? Explain using examples.

Workbook Page 157

Exercise 26

Replace

Use the order of operations to evaluate each expression. Discuss any that are undefined or yield complex imaginary results.

with

Use the order of operations to evaluate each expression. Classify each expression as real, imaginary, or undefined before evaluating.

Workbook Page 162

A Primer on the Language of Sets

Insert

In this workbook, we include 0 in the set of natural numbers.

Workbook Page 163

Interval Notation

Insert

Note: Interval notation always describes subsets of the real numbers.

Workbook Page 166

Heading

Replace

Quadratic Numbers

with

Quadratic Numbers (Radical Expressions)

Workbook Page 169

Algebraic Expressions

Insert

Reflection: Give an example of an expression that is a term in one context and a factor in another.

Workbook Page 173

Simplifying Expressions

Insert

Note: Combine like terms only after distribution is complete.

Workbook Page 178

Substitution and Order of Operations

Insert

Substitution is a separate preliminary step before applying the order of operations.

Workbook Page 183

Introduction to Algebraic Equations

Insert

Supplementary Example: Solve by observation $\sqrt{x} = 4$.

Also, after the zero-product property, insert the following:

Reflection: Explain why the property above does not extend to sums.

Workbook Page 184

Algebraic Equations

Insert

Reflection: Are the equations $(s - 5)(s - 5) = 0$ and $s^2 = 25$ equivalent?

Workbook Page 186

Balancing Equations

Insert

Reflection: Explain why every balancing step preserves equivalence.

Workbook Page 188

Linear Equations

Replace

Simplify each side. This may involve:

with

Simplify each side completely before balancing. This may involve:

Workbook Page 191

The Mapping Diagram

Insert

Note: The diagram is essentially a graphical representation of the balancing method.

Workbook Page 197

Problem-Solving Steps

Replace step 4

Review the solution: interpret and verify the result in the context of the problem.

with

Review the solution: interpret and verify that the solution satisfies the original problem.

Workbook Page 198

Exercise 18

After the age problem, insert

Draw a timeline before writing the equation.

Workbook Page 201

Launch Exploration: Construct a Square from Two Squares

After the questions, insert

Reflection: What does the puzzle reveal about the areas of the squares built on the sides of a right triangle?

Workbook Page 203

Angles and Circles

Insert

Angle measure is independent of side length.

Where the exercise asks for a fraction of a complete circle, append

Express the answer as a degree measure.

Workbook Page 208

Triangles

Insert

Note: Many texts use AAS rather than SAA.

Workbook Page 213

Pythagorean Theorem

Insert

Pythagoras (c. 570–495 BC) was a Greek mathematician whose school is believed to have been among the first to give a proof of the theorem.

Workbook Page 214

Tree-Height Problem

After the rounding instruction, insert

Ignore the trunk of the tree.

Workbook Page 216

Exercise 28

Replace

How tall is a tree in the shape of an isosceles triangle with base 4 m and leg 5 m?

with

How tall is a tree in the shape of an isosceles triangle with base 4 m and leg 5 m? Ignore the trunk of the tree.

Workbook Page 218

Area

After the definition ending “without gaps or overlaps,” insert

Area units must always be square units.

Workbook Page 221

Exercise 3

Replace the final instruction

Round to the hundredths place.

with

Round answers to the hundredths place and include units.

Workbook Page 222

Perimeter of a Circle

Replace

What is the perimeter of a circle?

with

What is the perimeter of a circle? Define the constant π and state the theorem that justifies its definition.

Workbook Page 223

Perimeter Example

Insert

The perimeter includes the diameter as well as the arc.

Workbook Page 229

Exercise, Part (c)

Append

Assume the figure is symmetric and is composed of a rectangle and an isosceles triangle.

Workbook Page 236

Volume of Prisms and Cylinders

After the definition ending “fill the solid,” insert

Volume units are always cubic units.

Also insert

Reflection: Explain how the derivation of the volume formula is related to the Fundamental Principle of Multiplication.

Workbook Page 237

Cylinder Volume

Insert

Reflection: Compare the volume formula of a cylinder with that of a prism.

Workbook Page 244

Skills Practice: Fraction Operations

Replace

Less?

with

Less than 1 whole?

in the estimation prompt.

Workbook Page 252

Skills Practice: Percent, Fraction, and Decimal Conversions

Insert

Reflection: Describe the relationships among the three representations: percents, fractions, and decimals.

Workbook Page 261

Skills Practice: Radicals

Insert

Classify each result as real, imaginary, or undefined before evaluation.

Workbook Page 263

Skills Practice: Logarithms

Insert

Reflection: Explain verbally what a logarithm represents.

Workbook Page 264

Skills Practice: Simplifying Expressions

Replace

Simplify each to a monomial in standard form and name its degree.

with

Simplify each to a monomial in standard form and name its coefficient, variable(s), and degree.

Workbook Page 267

Skills Practice: Geometry

In the opening instruction, append

and include units.

after the direction to round to hundredths.

For Exercise 6, replace

How tall is a tree in the shape of an isosceles triangle with base 9 ft and leg 6 ft?

with

How tall is a tree in the shape of an isosceles triangle with base 9 ft and leg 6 ft? Ignore the trunk of the tree.

Workbook Page 268

Skills Practice: Area and Perimeter

Replace

Round to hundredths if rounding is necessary.

with

Round to hundredths if rounding is necessary and include units.

Workbook Page 270

Skills Practice: Volumes

Replace

For each solid (1)–(6) described below, draw and label a diagram, write its volume formula, and evaluate the formula.

with

For each solid (1)–(7) described below, draw and label a diagram, write its volume formula, and evaluate the formula.

Treat the tanker problem as Exercise 7 and renumber the exercises that follow accordingly.