

BIG IDEAS MATH
Course 3 (Common Core)
California Edition

Foundations Review

Alejandro De La Torre

Winter Break 2025

Quick Links

[Latest version & replication files](#)

[Textbook \(Online Access\)](#)

[Basic Skills Handbook](#)

[Skills Review Handbook](#)

[Multi-Language Glossary](#)

[Glossary Flashcards \(PDF\)](#)

Dedication. For Lizbeth. You are smart, brilliant, and capable of anything you set your mind to. Please remember to take breaks, drink water, and get some fresh air, eat good yums, mimis, and take your time.

Contents

0 Absolute Foundations	6
0.1 Integers & Signs	6
0.2 Order of Operations	12
0.3 Distributive Property	17
0.4 Mixed Foundations Review	22
1 Equations	23
1.1 Solving Simple Equations	23
1.2 Solving Multi-Step Equations	24
1.3 Solving Equations with Variables on Both Sides	25
1.4 Rewriting Equations and Formulas	26
2 Transformations	27
2.1 Congruent Figures	27
2.2 Translations	28
2.3 Reflections	29
2.4 Rotations	30
2.5 Similar Figures	31
2.6 Perimeters and Areas of Similar Figures	32
2.7 Dilations	33
3 Angles and Triangles	34
3.1 Parallel Lines and Transversals	34
3.2 Angles of Triangles	35
3.3 Angles of Polygons	36
3.4 Using Similar Triangles	37
3.5 Chapter 3 Review	38

4 Graphing and Writing Linear Equations	39
4.1 Graphing Linear Equations	39
4.2 Slope of a Line	40
4.3 Graphing Proportional Relationships	41
4.4 Graphing Linear Equations in Slope-Intercept Form	42
4.5 Graphing Linear Equations in Standard Form	43
4.6 Writing Equations in Slope-Intercept Form	44
4.7 Writing Equations in Point-Slope Form	45
4.8 Chapter 4 Review	46
5 Systems of Linear Equations	47
5.1 Solving Systems of Linear Equations by Graphing	47
5.2 Section 5.2	48
5.3 Section 5.3	49
5.4 Section 5.4	50
5.5 Chapter 5 Review	51
6 Functions	52
6.1 Section 6.1	52
6.2 Section 6.2	53
6.3 Section 6.3	54
6.4 Section 6.4	55
6.5 Section 6.5	56
6.6 Chapter 6 Review	57
7 Real Numbers and the Pythagorean Theorem	58
7.1 Section 7.1	58
7.2 Section 7.2	59
7.3 Section 7.3	60
7.4 Section 7.4	61
7.5 Section 7.5	62
7.6 Chapter 7 Review	63
8 Volume and Similar Solids	64
8.1 Section 8.1	64
8.2 Section 8.2	65
8.3 Section 8.3	66

8.4	Section 8.4	67
8.5	Chapter 8 Review	68
9	Data Analysis and Displays	69
9.1	Section 9.1	69
9.2	Section 9.2	70
9.3	Section 9.3	71
9.4	Section 9.4	72
9.5	Chapter 9 Review	73
10	Exponents and Scientific Notation	74
10.1	Section 10.1	74
10.2	Section 10.2	75
10.3	Section 10.3	76
10.4	Section 10.4	77
10.5	Section 10.5	78
10.6	Section 10.6	79
10.7	Section 10.7	80
10.8	Chapter 10 Review	81
A	Solutions	82
A.1	Chapter 0 — Absolute Foundations	83
	A.1.1 0.1 Integers & Signs	83
	A.1.2 0.2 Order of Operations	83
	A.1.3 0.3 Distributive Property	83
A.2	Chapter 1 — Equations	83
A.3	Chapter 2 — Transformations	83
A.4	Chapter 3 — Angles and Triangles	83
A.5	Chapter 4 — Graphing and Writing Linear Equations	83
A.6	Chapter 5 — Systems of Linear Equations	83
A.7	Chapter 6 — Functions	83
A.8	Chapter 7 — Real Numbers and the Pythagorean Theorem	83
A.9	Chapter 8 — Volume and Similar Solids	83
A.10	Chapter 9 — Data Analysis and Displays	83
A.11	Chapter 10 — Exponents and Scientific Notation	83

B Worked Examples	84
B.1 Chapter 0 — Absolute Foundations	85
B.1.1 0.1 Integers & Signs — Worked Examples	85
B.1.2 0.3 Distributive Property — Worked Examples	85
B.2 Chapter 1 — Equations	85
B.3 Chapter 2 — Transformations	85
B.4 Chapter 3 — Angles and Triangles	85
B.5 Chapter 4 — Graphing and Writing Linear Equations	85
B.6 Chapter 5 — Systems of Linear Equations	85
B.7 Chapter 6 — Functions	85
B.8 Chapter 7 — Real Numbers and the Pythagorean Theorem	85
B.9 Chapter 8 — Volume and Similar Solids	85
B.10 Chapter 9 — Data Analysis and Displays	85
B.11 Chapter 10 — Exponents and Scientific Notation	85

Chapter 0

Absolute Foundations

0.1 Integers & Signs

[← Contents](#)[✓ Solutions](#)

Integers & Signs

Chapter 0 — Absolute Foundations

Show all work. Slow down on negative signs. When you feel stuck, rewrite subtraction as “add the opposite.”

Name: _____ Date: _____

Key Ideas — Integers & Signs

- **Integers** are whole numbers and their opposites: $\dots, -3, -2, -1, 0, 1, 2, 3, \dots$
- **Opposites:** a and $-a$ are opposites. Example: the opposite of 7 is -7 .
- **Absolute value:** $|a|$ is the distance from 0. Always nonnegative.
- **Subtracting:** $a - b = a + (-b)$ (subtracting is adding the opposite).
- **Sign rules:**
 - $(-)(-) = (+)$ and $(+)(-) = (-)$ and $(-)(+) = (-)$
 - Same signs \Rightarrow add magnitudes and keep the sign.

- Different signs \Rightarrow subtract magnitudes and keep the sign of the larger magnitude.

- **Distributing negatives:**

$$-(a + b) = -a - b \quad \text{and} \quad -(a - b) = -a + b.$$

Quick Examples (read, then try the practice)

Example 1. Rewrite subtraction as addition:

$$6 - (-4) = 6 + 4 = 10.$$

Example 2. Different signs (subtract magnitudes):

$$-12 + 5 = -(12 - 5) = -7.$$

Example 3. Distribute a negative:

$$-(3x - 8) = -3x + 8.$$

Example 4. Combine like terms carefully:

$$-2x + 7x - (x - 5) = 5x - x + 5 = 4x + 5.$$

Practice A — Integer Operations

Compute. (No calculators.)

1. $7 + (-3) =$

2. $-8 + (-6) =$

3. $-15 + 9 =$

$$4. \ 12 - 19 =$$

$$5. \ -4 - 11 =$$

$$6. \ -13 - (-5) =$$

$$7. \ 18 - (-7) =$$

$$8. \ (-6)(-5) =$$

$$9. \ (9)(-4) =$$

$$10. \ \frac{-42}{6} =$$

$$11. \ \frac{-36}{-9} =$$

$$12. \ |-17| =$$

Practice B — Decode the Signs

Rewrite each expression to make the signs clearer, then simplify.

$$1. \ 10 - (-3) + (-2)$$

$$2. \ -5 - (-8) - 4$$

$$3. \ -12 + 6 - (-9)$$

$$4. \ 3 - 7 + (-11)$$

$$5. \ -20 - (-6) + 2$$

$$6. \ -1 - (-1) - (-1)$$

Practice C — Distribute with Negatives

Distribute. Then simplify.

$$1. \ -(x + 9)$$

$$2. \ -(4x - 7)$$

$$3. \ -3(2x - 5)$$

$$4. \ 2 - (x - 6)$$

$$5. \ -(2x + 3y)$$

$$6. \ -(a - b + c)$$

$$7. \ -5(3m + 2) - (-4m)$$

Practice D — Simplify Expressions

Simplify completely.

1. $-7x + 3x$

2. $8y - (3y - 5)$

3. $-(2x - 3) + (x - 10)$

4. $4a - 2(a - 6)$

5. $-3(2p - 1) + 5p$

6. $6 - 2(4 - x)$

Challenge (optional)

Take your time. Check your signs.

1. Simplify: $-(2x - 5) - (3x + 4) + 9$

2. Simplify: $-(4 - (2y - 7))$

3. Simplify: $3(-(x - 2)) - 2(x - 6)$

4. A number is -8 units from 0 . What are the possible numbers? Explain.

0.2 Order of Operations

[← Contents](#)[✓ Solutions](#)

Order of Operations

Chapter 0 — Absolute Foundations

Show all work. Rewrite subtraction as “add the opposite” when helpful. Use parentheses to keep your steps organized.

Name: _____ Date: _____

Key Idea — Order of Operations (PEMDAS)

Always do operations in this order:

1. Parentheses (grouping symbols)

2. Exponents

3. Multiplication and Division *from left to right*

4. Addition and Subtraction *from left to right*

Important: Multiplication and division are a *pair* (same priority). Addition and subtraction are a *pair* (same priority).

Common Mistakes to Avoid

- Doing addition before multiplication. Example: $3 + 2 \cdot 5$ is $3 + 10 = 13$, not $(3 + 2) \cdot 5$.
- Forgetting left-to-right for \div and \times . Example: $24 \div 3 \cdot 2$ is $(24 \div 3) \cdot 2 = 16$.
- Losing negative signs. Rewrite subtraction as addition: $a - b = a + (-b)$.
- Forgetting parentheses after a minus sign: $-(x - 7) = -x + 7$.

Worked Examples (follow the order)

Example 1. Evaluate: $6 + 3 \cdot 4$

$$6 + 3 \cdot 4 = 6 + 12 = 18.$$

Example 2. Evaluate: $24 \div 3 \cdot 2$

$$24 \div 3 \cdot 2 = (24 \div 3) \cdot 2 = 8 \cdot 2 = 16.$$

Example 3. Evaluate: $-(5 - 12) + 3^2$

$$-(5 - 12) + 3^2 = -(-7) + 9 = 7 + 9 = 16.$$

Example 4. Simplify: $2(3x - (x - 4))$

$$2(3x - (x - 4)) = 2(3x - x + 4) = 2(2x + 4) = 4x + 8.$$

Mini-check. Evaluate: $10 - 2 \cdot (3 + 1) \Rightarrow \underline{\hspace{2cm}}$

Practice A — Evaluate (Warm-Up)

Evaluate.

$$1. \ 8 + 2 \cdot 6$$

$$2. \ 30 - 5 \cdot 4$$

$$3. \ 18 \div 3 + 7$$

$$4. \ 4^2 - 3 \cdot 5$$

$$5. \ 12 \div 2 \cdot 3$$

$$6. \ 36 \div (6 \cdot 3)$$

$$7. \ 7(5 - 2) + 1$$

$$8. \ 9 - (2 + 4)^2$$

Practice B — Parentheses & Negatives

Evaluate.

$$1. \ -(8 - 13) + 6$$

$$2. -3(2 - 7)$$

$$3. 5 - (3 - 9)$$

$$4. 2(4 - (1 - 6))$$

$$5. -2^3 + 10$$

$$6. (-2)^3 + 10$$

Practice C — Simplify (Variables)

Simplify completely.

$$1. \ 3x + 2x \cdot 4$$

$$2. \ 10 - 2(3x + 1)$$

$$3. \ 4(x + 2) - 3(x - 5)$$

$$4. \ 2(3x - (x - 7))$$

$$5. \ 6 - 2(4 - x)$$

$$6. \ -(2x - 3) + 5(x - 1)$$

Challenge (optional)

Take your time. Organize with parentheses.

$$1. \text{ Evaluate: } 48 \div 6 \cdot 2 + 3^2$$

$$2. \text{ Simplify: } 2(5 - (3x - 2)) - (x - 4)$$

3. Explain in one sentence why $24 \div 3 \cdot 2 \neq 24 \div (3 \cdot 2)$.

0.3 Distributive Property

[← Contents](#)

[✓ Solutions](#)

Distributive Property

Chapter 0 — Absolute Foundations

*Directions: Show all work. Distribute to **every** term inside parentheses.*

Name: _____ Date: _____

Key Idea — Distributive Property

Distribute (multiply) to every term inside the parentheses.

Form: $a(b + c) = ab + ac$ and $a(b - c) = ab - ac$.

Helpful memory: Whatever is outside the parentheses gets multiplied by each term inside.

Common Mistakes to Avoid

- **Forgetting a term:** $3(x + 5)$ must become $3x + 15$ (not just $3x + 5$).
- **Sign mistakes:** $-2(x - 4) = -2x + 8$.
- **Parentheses matter:** $-(x - 7) = -x + 7$.
- **Combining unlike terms too early:** Distribute first, then simplify.

Worked Examples (Follow the Steps)

Example 1. Expand: $4(x + 3)$

$$4(x + 3) = 4 \cdot x + 4 \cdot 3 = 4x + 12.$$

Example 2. Expand: $-3(2x - 5)$

$$-3(2x - 5) = (-3) \cdot 2x + (-3) \cdot (-5) = -6x + 15.$$

Example 3. Expand and simplify: $2(x + 4) + 3(x - 1)$

$$2(x + 4) + 3(x - 1) = (2x + 8) + (3x - 3) = 5x + 5.$$

Example 4. Factor using the distributive property (reverse direction): $6x + 18$

$$6x + 18 = 6(x + 3).$$

Your turn (mini-check). Expand: $-(x + 9) \Rightarrow \underline{\hspace{2cm}}$

Practice A — Distribute (Warm-Up)

Expand. (Distribute to *every* term.)

1. $3(x + 7)$

2. $5(x - 2)$

3. $-4(x + 6)$

4. $2(3x + 1)$

5. $-7(2x - 5)$

6. $\frac{1}{2}(8x - 10)$

Practice B — Distribute with Negatives and Parentheses

Expand and simplify.

$$1. -(x - 8)$$

$$2. -(2x + 3)$$

$$3. -2(x - 9)$$

$$4. -3(4x + 2)$$

$$5. 2 - (x - 5)$$

$$6. 7 - (2x + 1)$$

Practice C — Combine Like Terms After Distributing

Expand, then simplify completely.

$$1. 2(x + 5) + x$$

$$2. 3(x - 4) + 2x$$

$$3. 4(x + 1) - 2(x - 3)$$

$$4. -3(x - 2) + 5(x + 1)$$

$$5. \ 2(2x - 1) + 3(x + 4)$$

$$6. \ 5(x - 3) - 2(3x - 7)$$

Practice D — Factor (Distribute Backwards)

Factor out the greatest common factor (GCF).

$$1. \ 8x + 24$$

$$2. \ 15x - 10$$

$$3. \ 12x + 18$$

$$4. \ 9x - 27$$

$$5. \ 14x + 21$$

$$6. \ 6x - 42$$

Practice E — Spot the Distributive Property

For each, circle the part where the distributive property is used, then write the simplified result.

$$1. \ 3(x + 2) + 3(x - 5)$$

$$2. \ 10(0.3x + 0.7)$$

$$3. \ 2(5 + x)$$

$$4. \ -(x - 4) + 2(x - 4)$$

Challenge (Optional)

These are a bit harder — try your best.

$$1. \text{ Find } x \text{ if } 3(x - 2) = 2x + 7.$$

$$2. \text{ Simplify: } 2(3x - (x - 4)).$$

0.4 Mixed Foundations Review

Chapter 1

Equations

1.1 Solving Simple Equations

1.2 Solving Multi-Step Equations

1.3 Solving Equations with Variables on Both Sides

1.4 Rewriting Equations and Formulas

Chapter 2

Transformations

2.1 Congruent Figures

2.2 Translations

2.3 Reflections

2.4 Rotations

2.5 Similar Figures

2.6 Perimeters and Areas of Similar Figures

2.7 Dilations

Chapter 3

Angles and Triangles

3.1 Parallel Lines and Transversals

3.2 Angles of Triangles

3.3 Angles of Polygons

3.4 Using Similar Triangles

3.5 Chapter 3 Review

Chapter 4

Graphing and Writing Linear Equations

4.1 Graphing Linear Equations

4.2 Slope of a Line

4.3 Graphing Proportional Relationships

4.4 Graphing Linear Equations in Slope-Intercept Form

4.5 Graphing Linear Equations in Standard Form

4.6 Writing Equations in Slope-Intercept Form

4.7 Writing Equations in Point-Slope Form

4.8 Chapter 4 Review

Chapter 5

Systems of Linear Equations

5.1 Solving Systems of Linear Equations by Graphing

5.2 Section 5.2

5.3 Section 5.3

5.4 Section 5.4

5.5 Chapter 5 Review

Chapter 6

Functions

6.1 Section 6.1

6.2 Section 6.2

6.3 Section 6.3

6.4 Section 6.4

6.5 Section 6.5

6.6 Chapter 6 Review

Chapter 7

Real Numbers and the Pythagorean Theorem

7.1 Section 7.1

7.2 Section 7.2

7.3 Section 7.3

7.4 Section 7.4

7.5 Section 7.5

7.6 Chapter 7 Review

Chapter 8

Volume and Similar Solids

8.1 Section 8.1

8.2 Section 8.2

8.3 Section 8.3

8.4 Section 8.4

8.5 Chapter 8 Review

Chapter 9

Data Analysis and Displays

9.1 Section 9.1

9.2 Section 9.2

9.3 Section 9.3

9.4 Section 9.4

9.5 Chapter 9 Review

Chapter 10

Exponents and Scientific Notation

10.1 Section 10.1

10.2 Section 10.2

10.3 Section 10.3

10.4 Section 10.4

10.5 Section 10.5

10.6 Section 10.6

10.7 Section 10.7

10.8 Chapter 10 Review

Appendix A

Solutions

A.1 Chapter 0 — Absolute Foundations

A.1.1 0.1 Integers & Signs

A.1.2 0.2 Order of Operations

A.1.3 0.3 Distributive Property

A.2 Chapter 1 — Equations

A.3 Chapter 2 — Transformations

A.4 Chapter 3 — Angles and Triangles

A.5 Chapter 4 — Graphing and Writing Linear Equations

A.6 Chapter 5 — Systems of Linear Equations

A.7 Chapter 6 — Functions

A.8 Chapter 7 — Real Numbers and the Pythagorean Theorem

A.9 Chapter 8 — Volume⁸³and Similar Solids

A.10 Chapter 9 — Data Analysis and Displays

Appendix B

Worked Examples

B.1 Chapter 0 — Absolute Foundations

B.1.1 0.1 Integers & Signs — Worked Examples

B.1.2 0.3 Distributive Property — Worked Examples

B.2 Chapter 1 — Equations

B.3 Chapter 2 — Transformations

B.4 Chapter 3 — Angles and Triangles

B.5 Chapter 4 — Graphing and Writing Linear Equations

B.6 Chapter 5 — Systems of Linear Equations

B.7 Chapter 6 — Functions

B.8 Chapter 7 — Real Numbers and the Pythagorean Theorem

B.9 Chapter 8 — Volume and Similar Solids

B.10 Chapter 9 — Data ⁸⁵Analysis and Displays

B.11 Chapter 10 — Exponents and Scientific Notation