

BIG IDEAS MATH  
Course 3 (Common Core)  
California Edition

## Foundations Review

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*Winter Break 2025*

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**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.

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# Chapter 0

## Absolute Foundations

### 0.1 Integers & Signs

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#### 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

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### 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: \_\_\_\_\_

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#### 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

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### 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

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### Mixed Foundations Review

Chapter 0 — Absolute Foundations

Show all work. Use PEMDAS. Rewrite subtraction as “add the opposite.” Distribute to every term. Keep track of negative signs carefully.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

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#### Skills This Review Mixes

- **Integers & signs:** adding/subtracting negatives; multiplying/dividing signs; rewriting subtraction.
- **Distributive property:**  $a(b + c) = ab + ac$  and  $-(b - c) = -b + c$ .
- **Order of operations:** parentheses, exponents, multiply/divide left to right, add/subtract left to right.
- **Simplify & solve:** combine like terms, then isolate the variable.

### Part A — Evaluate & Simplify (Warm-Up)

Evaluate or simplify.

1.  $8 - 3 \cdot (5 - 7)$

2.  $-12 + 4 \cdot 3 - 6$

3.  $24 \div 3 \cdot 2 - 5$

$$4. -(6 - 14) + 2^3$$

$$5. -3(2 - (5 - 9))$$

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

$$7. -2^3 + 10$$

$$8. (-2)^3 + 10$$

## Part B — Distribute, Then Combine Like Terms

Simplify completely.

$$1. -(x + 7) + 3x$$

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

$$3. -(4x - 9) - 2(x + 3)$$

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

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

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

$$7. -(2m - 3n + 4) + 2(m + n)$$

## Part C — Solve Equations (Watch the Signs)

Solve for the variable. Check by substitution when you can.

$$1. \ x - 9 = -4$$

$$2. \ -7 = x + 3$$

$$3. \ -3x = 24$$

$$4. \ \frac{x}{-6} = -5$$

$$5. \ 2x - 5 = 11$$

$$6. \ -4x + 9 = -19$$

$$7. \ 3(x - 4) = -18$$

$$8. \ -2(x + 7) = 10$$

$$9. \ 5 - (x - 3) = -4$$

$$10. \ 2(3x - 1) - 4 = 8$$

## Part D — Multi-Step (All Skills Together)

Simplify first, then solve.

$$1. \ 3 - (2x - 7) = 10$$

$$2. \ -(4x - 5) + 2x = 13$$

$$3. \ 2(x - 6) - 3(x + 1) = -8$$

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

$$5. \ \frac{1}{2}(6x - 8) - (x - 3) = 5$$

## Challenge (optional)

These are harder. Take your time and write neat steps.

1. A student earns \$12 per hour. They worked 5 hours, but had a \$8 fee taken out. Write and evaluate an expression for their pay.
  
2. The temperature was  $-3^{\circ}\text{F}$ . Overnight it dropped 7 degrees, then rose 5 degrees. What is the final temperature?

3. Solve and interpret:  $-2(x - 4) + 3 = 17$ . (What number makes the equation true?)
4. True or false? Explain:  $-(a - b) = -a - b$ .

# 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

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### **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**

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# 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

##### Practice A — Integer Operations

$$1. 7 + (-3) = 4$$

$$2. -8 + (-6) = -14$$

$$3. -15 + 9 = -6$$

$$4. 12 - 19 = -7$$

$$5. -4 - 11 = -15$$

$$6. -13 - (-5) = -13 + 5 = -8$$

$$7. 18 - (-7) = 18 + 7 = 25$$

$$8. (-6)(-5) = 30$$

$$9. (9)(-4) = -36$$

$$10. \frac{-42}{6} = -7$$

$$11. \frac{-36}{-9} = 4$$

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

### Practice B — Decode the Signs

$$1. 10 - (-3) + (-2) = 10 + 3 - 2 = 11$$

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

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

$$4. 3 - 7 + (-11) = 3 - 7 - 11 = -15$$

$$5. -20 - (-6) + 2 = -20 + 6 + 2 = -12$$

$$6. -1 - (-1) - (-1) = -1 + 1 + 1 = 1$$

### Practice C — Distribute with Negatives

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

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

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

$$4. 2 - (x - 6) = 2 - x + 6 = 8 - x$$

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

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

$$7. -5(3m + 2) - (-4m) = (-15m - 10) + 4m = -11m - 10$$

### Practice D — Simplify Expressions

$$1. -7x + 3x = -4x$$

2.  $8y - (3y - 5) = 8y - 3y + 5 = 5y + 5$
3.  $-(2x - 3) + (x - 10) = (-2x + 3) + x - 10 = -x - 7$
4.  $4a - 2(a - 6) = 4a - 2a + 12 = 2a + 12$
5.  $-3(2p - 1) + 5p = (-6p + 3) + 5p = -p + 3$
6.  $6 - 2(4 - x) = 6 - (8 - 2x) = 2x - 2$

### Challenge (optional)

1.  $-(2x - 5) - (3x + 4) + 9 = (-2x + 5) + (-3x - 4) + 9 = -5x + 10$
2.  $-(4 - (2y - 7)) = -(4 - 2y + 7) = -(11 - 2y) = 2y - 11$
3.  $3(-(x - 2)) - 2(x - 6) = 3(-x + 2) - (2x - 12) = -5x + 18$
4. A number that is  $-8$  units from  $0$  can be  $8$  or  $-8$ .

## A.1.2 0.2 Order of Operations

### Practice A — Evaluate (Warm-Up)

1.  $8 + 2 \cdot 6 = 8 + 12 = 20$
2.  $30 - 5 \cdot 4 = 30 - 20 = 10$
3.  $18 \div 3 + 7 = 6 + 7 = 13$
4.  $4^2 - 3 \cdot 5 = 16 - 15 = 1$
5.  $12 \div 2 \cdot 3 = (12 \div 2) \cdot 3 = 6 \cdot 3 = 18$
6.  $36 \div (6 \cdot 3) = 36 \div 18 = 2$
7.  $7(5 - 2) + 1 = 7 \cdot 3 + 1 = 22$

$$8. \ 9 - (2 + 4)^2 = 9 - 6^2 = 9 - 36 = -27$$

### Practice B — Parentheses & Negatives

$$1. \ -(8 - 13) + 6 = -(-5) + 6 = 11$$

$$2. \ -3(2 - 7) = -3(-5) = 15$$

$$3. \ 5 - (3 - 9) = 5 - (-6) = 11$$

$$4. \ 2(4 - (1 - 6)) = 2(4 - (-5)) = 2 \cdot 9 = 18$$

$$5. \ -2^3 + 10 = -(2^3) + 10 = -8 + 10 = 2$$

$$6. \ (-2)^3 + 10 = -8 + 10 = 2$$

### Practice C — Simplify (Variables)

$$1. \ 3x + 2x \cdot 4 = 3x + 8x = 11x$$

$$2. \ 10 - 2(3x + 1) = 10 - (6x + 2) = 8 - 6x$$

$$3. \ 4(x + 2) - 3(x - 5) = (4x + 8) - (3x - 15) = x + 23$$

$$4. \ 2(3x - (x - 7)) = 2(3x - x + 7) = 2(2x + 7) = 4x + 14$$

$$5. \ 6 - 2(4 - x) = 6 - (8 - 2x) = 2x - 2$$

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

### Challenge (optional)

$$1. \ 48 \div 6 \cdot 2 + 3^2 = (48 \div 6) \cdot 2 + 9 = 8 \cdot 2 + 9 = 25$$

$$2. \ 2(5 - (3x - 2)) - (x - 4) = 2(7 - 3x) - x + 4 = 18 - 7x$$

3. Because division and multiplication have the same priority, you work left-to-right:  
 $24 \div 3 \cdot 2 = (24 \div 3) \cdot 2.$

### A.1.3 0.3 Distributive Property

Your turn (mini-check)

$$-(x + 9) = -x - 9$$

#### Practice A — Distribute (Warm-Up)

1.  $3(x + 7) = 3x + 21$

2.  $5(x - 2) = 5x - 10$

3.  $-4(x + 6) = -4x - 24$

4.  $2(3x + 1) = 6x + 2$

5.  $-7(2x - 5) = -14x + 35$

6.  $\frac{1}{2}(8x - 10) = 4x - 5$

#### Practice B — Distribute with Negatives and Parentheses

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

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

3.  $-2(x - 9) = -2x + 18$

4.  $-3(4x + 2) = -12x - 6$

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

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

#### Practice C — Combine Like Terms After Distributing

1.  $2(x + 5) + x = (2x + 10) + x = 3x + 10$

2.  $3(x - 4) + 2x = (3x - 12) + 2x = 5x - 12$

$$3. \quad 4(x + 1) - 2(x - 3) = (4x + 4) - (2x - 6) = 2x + 10$$

$$4. \quad -3(x - 2) + 5(x + 1) = (-3x + 6) + (5x + 5) = 2x + 11$$

$$5. \quad 2(2x - 1) + 3(x + 4) = (4x - 2) + (3x + 12) = 7x + 10$$

$$6. \quad 5(x - 3) - 2(3x - 7) = (5x - 15) - (6x - 14) = -x - 1$$

#### Practice D — Factor (Distribute Backwards)

$$1. \quad 8x + 24 = 8(x + 3)$$

$$2. \quad 15x - 10 = 5(3x - 2)$$

$$3. \quad 12x + 18 = 6(2x + 3)$$

$$4. \quad 9x - 27 = 9(x - 3)$$

$$5. \quad 14x + 21 = 7(2x + 3)$$

$$6. \quad 6x - 42 = 6(x - 7)$$

#### Practice E — Spot the Distributive Property

$$1. \quad 3(x + 2) + 3(x - 5) = (3x + 6) + (3x - 15) = 6x - 9$$

$$2. \quad 10(0.3x + 0.7) = 3x + 7$$

$$3. \quad 2(5 + x) = 10 + 2x = 2x + 10$$

$$4. \quad -(x - 4) + 2(x - 4) = (-x + 4) + (2x - 8) = x - 4$$

#### Challenge (Optional)

$$1. \quad 3(x - 2) = 2x + 7 \Rightarrow 3x - 6 = 2x + 7 \Rightarrow x = 13$$

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

## A.1.4 0.4 Mixed Foundations Review

### Part A — Evaluate & Simplify (Warm-Up)

$$1. \ 8 - 3 \cdot (5 - 7) = 8 - 3 \cdot (-2) = 8 + 6 = 14$$

$$2. \ -12 + 4 \cdot 3 - 6 = -12 + 12 - 6 = -6$$

$$3. \ 24 \div 3 \cdot 2 - 5 = (24 \div 3) \cdot 2 - 5 = 8 \cdot 2 - 5 = 11$$

$$4. \ -(6 - 14) + 23 = -(-8) + 23 = 31$$

$$5. \ -3(2 - (5 - 9)) = -3(2 - (-4)) = -3 \cdot 6 = -18$$

$$6. \ 5 - (3 - (2 - 7)) = 5 - (3 - (-5)) = 5 - 8 = -3$$

$$7. \ -2^3 + 10 = -(2^3) + 10 = -8 + 10 = 2$$

$$8. \ (-2)^3 + 10 = -8 + 10 = 2$$

### Part B — Distribute, Then Combine Like Terms

$$1. \ -(x + 7) + 3x = -x - 7 + 3x = 2x - 7$$

$$2. \ 2(3x - 5) - (x - 4) = (6x - 10) - x + 4 = 5x - 6$$

$$3. \ -(4x - 9) - 2(x + 3) = (-4x + 9) + (-2x - 6) = -6x + 3$$

$$4. \ 5 - 3(2x - 1) = 5 - (6x - 3) = 8 - 6x$$

$$5. \ -2(3y - 8) + (y - 5) = (-6y + 16) + y - 5 = -5y + 11$$

$$6. \ 4(2a - (a - 6)) = 4(a + 6) = 4a + 24$$

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

### Part C — Solve Equations (Watch the Signs)

1.  $x - 9 = -4 \Rightarrow x = 5$

2.  $-7 = x + 3 \Rightarrow x = -10$

3.  $-3x = 24 \Rightarrow x = -8$

4.  $\frac{x}{-6} = -5 \Rightarrow x = 30$

5.  $2x - 5 = 11 \Rightarrow 2x = 16 \Rightarrow x = 8$

6.  $-4x + 9 = -19 \Rightarrow -4x = -28 \Rightarrow x = 7$

7.  $3(x - 4) = -18 \Rightarrow x - 4 = -6 \Rightarrow x = -2$

8.  $-2(x + 7) = 10 \Rightarrow x + 7 = -5 \Rightarrow x = -12$

9.  $5 - (x - 3) = -4 \Rightarrow 5 - x + 3 = -4 \Rightarrow 8 - x = -4 \Rightarrow x = 12$

10.  $2(3x - 1) - 4 = 8 \Rightarrow 6x - 6 = 8 \Rightarrow 6x = 14 \Rightarrow x = \frac{7}{3}$

### Part D — Multi-Step (All Skills Together)

1.  $3 - (2x - 7) = 10 \Rightarrow 3 - 2x + 7 = 10 \Rightarrow 10 - 2x = 10 \Rightarrow x = 0$

2.  $-(4x - 5) + 2x = 13 \Rightarrow -4x + 5 + 2x = 13 \Rightarrow -2x = 8 \Rightarrow x = -4$

3.  $2(x - 6) - 3(x + 1) = -8 \Rightarrow (2x - 12) - (3x + 3) = -8 \Rightarrow -x - 15 = -8 \Rightarrow x = -7$

4.  $5(2x - 3) + 4 = 3(3x + 2) \Rightarrow 10x - 11 = 9x + 6 \Rightarrow x = 17$

5.  $\frac{1}{2}(6x - 8) - (x - 3) = 5 \Rightarrow (3x - 4) - x + 3 = 5 \Rightarrow 2x - 1 = 5 \Rightarrow x = 3$

### Challenge (optional)

1. Expression:  $12 \cdot 5 - 8$ . Value:  $60 - 8 = 52$ . (\$52)

2.  $-3 - 7 + 5 = -5$  °F
3.  $-2(x - 4) + 3 = 17 \Rightarrow -2x + 11 = 17 \Rightarrow -2x = 6 \Rightarrow x = -3$
4. False. Correct rule:  $-(a - b) = -a + b$ .

## 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 — Volume and Similar Solids

## A.10 Chapter 9 — Data Analysis and Displays

## A.11 Chapter 10 — Exponents and Scientific Notation



# 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 <sup>98</sup>Analysis and Displays

### B.11 Chapter 10 — Exponents and Scientific Notation