California Mathematics 4

Chapter 3 Resource Masters

Includes:

Chapter Resources
- Graphic Organizer
- Student-Built Glossary
- Family Letter
- Anticipation Guide
- Game

Leveled Lesson Resources
- Reteach
- Skills Practice
- Homework Practice
- Problem-Solving Practice
- Enrich

Assessment Resources
- Individual Progress Checklist
- Chapter Diagnostic Test
- Chapter Pretest
- 3 Quizzes
- Mid-Chapter Test
- Vocabulary Test
- Oral Assessment
- Chapter Project Rubric
- Foldables Rubric
- 6 Chapter Tests
- Extended Response Test
- Student Recording Sheet
- Cumulative Standardized Test Practice
- Answer Pages
- Chapter 3 Assessment Line-up
- Answer Keys

All Answers Included
# Grade 4 Chapter 3
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Teacher’s Guide to Using the
Chapter 3 Resource Masters

The Chapter 3 Resource Masters includes the core materials needed for Chapter 3. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing on the TeacherWorks Plus™ CD-ROM.

Chapter Resources

Graphic Organizer (page 1) This master is a tool designed to assist students with comprehension of grade-level concepts. You can use this graphic organizer in coordination with the appropriate lesson. While the content and layout of these tools vary, their goal is to assist students by providing a visual representation from which they can learn new concepts.

Student Glossary (page 2) This master is a study tool that presents the key vocabulary terms from the chapter. You may suggest that students highlight or star the terms they do not understand. Give this list to students before beginning Lesson 3-1. Remind them to add these pages to their mathematics study notebooks.

Anticipation Guide (page 6) This master is a survey designed for use before beginning the chapter. You can use this survey to highlight what students may or may not know about the concepts in the chapter. If feasible, interview students in small groups, asking them the interview questions in the guide. There is space for recording how well students answer the questions before they complete the chapter. You may find it helpful to interview students a second time, after completing the chapter, to determine their progress.

Game (page 7) A game is provided to reinforce chapter concepts and may be used at appropriate times throughout the chapter.

Resources for Lessons

Reteach Each lesson has an associated Reteach worksheet. In general, the Reteach worksheet focuses on the same lesson content but uses a different approach, learning style, or modality than that used in the Student Edition. The Reteach worksheet closes with computational practice of the concept.

Skills Practice The Skills Practice worksheet for each lesson focuses on the computational aspect of the lesson. The Skills Practice worksheet may be helpful in providing additional practice of the skill taught in the lesson. It also contains word problems that cover the skill. Spaces for students’ answers are provided on the worksheet.

Homework Practice The Homework Practice Worksheet provides an opportunity for additional computational practice. The Homework Practice Worksheet includes word problems that address the skill taught in the lesson. Spaces for students’ answers are provided on the worksheet.

Problem-Solving Practice The Problem-Solving Practice worksheet presents additional reinforcement in solving word problems that apply both the concepts of the lesson and some review concepts.

Enrich The Enrich worksheet presents activities that extend the concepts of the lesson or offer a historical or multicultural look at the lesson’s concepts. Some Enrich materials are designed to widen students’ perspectives on the mathematics they are learning.

Resources for Problem-Solving Lessons
In recognition of the importance of problem-solving strategies, worksheets for problem-solving lessons follow a slightly different format. For problem-solving lessons, a two-page Reteach worksheet offers a complete model for choosing a problem-solving strategy. For each Problem-Solving Strategy lesson, Reteach and Homework
Practice worksheets offer reinforcement of the strategy taught in the Student Edition lesson. In contrast, the Problem-Solving Investigation worksheets include a model strategy on the Reteach worksheets and provide problems requiring several alternate strategies on practice worksheets.

**Assessment Options**

The assessment masters in the *Chapter 3 Resource Masters* offer a wide variety of assessment tools for monitoring progress as well as final assessment.

**Individual Progress Checklist** This checklist explains the chapter’s goals or objectives. Teachers can record whether a student’s mastery of each objective is beginning (B), developing (D), or mastered (M). The checklist includes space to record notes to parents as well as other pertinent observations.

**Chapter Diagnostic Assessment** This one-page test assesses students’ grasp of skills that are needed for success in the chapter.

**Chapter Pretest** This one-page quick check of the chapter’s concepts is useful for determining pacing. Performance on the pretest can help you determine which concepts can be covered quickly and which specific concepts may need additional time.

**Quizzes** Three free-response quizzes offer quick assessment opportunities at appropriate intervals in the chapter.

**Mid-Chapter Review** This one-page chapter test provides an option to assess the first half of the chapter. It includes both multiple-choice and free-response questions.

**Vocabulary Test** This one-page test focuses on chapter vocabulary. It is suitable for all students. It includes a list of vocabulary words and questions to assess students’ knowledge of the words.

**Oral Assessment** This two-page test consists of one page for teacher directions and questions and a second page for recording responses. Although this assessment is designed to be used with all students, the interview format focuses on assessing chapter content assimilated by ELL students. The variety of approaches includes solving problems using manipulatives as well as pencil and paper.

**Chapter Project Rubric** This one-page rubric is designed for use in assessing the chapter project. You may want to distribute copies of the rubric when you assign the project and use the rubric to record each student’s chapter project score.

**Foldables Rubric** This one-page rubric is designed to assess the Foldables graphic organizer. The rubric is written to the students, telling them what you will be looking for as you evaluate their completed Foldables graphic organizer.

**Leveled Chapter Tests**

- **Form 1** assesses basic chapter concepts through multiple-choice questions and is designed for use with on-level students.
- **Form 2A** is designed for on-level students and is primarily for those who may have missed the Form 1 test. It may be used as a retest for students who received additional instruction following the Form 1 test.
- **Form 2B** is designed for students with a below-level command of the English language.
- **Form 2C** is a free-response test designed for on-level students.
- **Form 2D** is written for students with a below-level command of the English language.
- **Form 3** is a free-response test written for above-level students.
- **Extended-Response Test** is an extended response test for on-level students.

**Student Recording Sheet** This one-page recording sheet is for the standardized test in the Student Edition.

**Cumulative Standardized Test Practice**

This two-page test, aimed at on-level students, offers a page of multiple-choice questions and a page of free-response questions.

**Answers**

The answers for the Anticipation Guide and Lesson Resources are provided as reduced pages with answers appearing in black. Full size line-up answer keys are provided for the Assessment Masters.
Use this graphic organizer to take notes on **Chapter 3: Algebra: Use Addition and Subtraction.**

Fill in the missing information.

<table>
<thead>
<tr>
<th>Algebra Term</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parentheses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Student-Built Glossary

This is an alphabetical list of new vocabulary terms you will learn in **Chapter 3: Algebra: Use Addition and Subtraction**. As you study the chapter, complete each term’s definition or description. Remember to add the page number where you found the term. Add this page to your math study notebook to review vocabulary at the end of the chapter.

<table>
<thead>
<tr>
<th>Vocabulary Term</th>
<th>Found on Page</th>
<th>Definition/Description/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>balance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>parentheses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td>solve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>variable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dear Family,

Today my class started Chapter 3: Algebra: Use Addition and Subtraction. I will be learning to solve addition and subtraction equations. I will work on equations and identify extra and missing information when solving problems. Here are my vocabulary words and an activity that we can do together.

Love, ________________

Key Vocabulary

**expression** A combination of numbers, variables, and operation symbols that represents a mathematical quantity. $3(x) = 27$

**variable** A letter or symbol used to represent an unknown quantity. $3(x) = 27$, $x$, is the variable.

**parentheses** Tell you which operation to perform first. $12 - (7 + 2)$

**equation** A mathematical sentence that contains an equals sign, =, indicating that the left side of the equals sign has the same value as the right side. $4 + 5 = 9$

**balance** When the amount on the left side of an equation is the same as the amount on the right side, both sides are equal and the equation is balanced. $5 + 1 + 5 = 6 + 2 + 3$

**pattern** A sequence of numbers, figures, or symbols that follows a rule or design. $2, 4, 6, 8$

Activity

Place 2 plates next to each other. Think of each plate as one side of an equation. Place 1 dime on each plate. Add 3 nickels to the left plate. Place 1 dime on the right plate. Are the values on each plate equal? Remove a dime from each plate. What are the new values? Are they equal? What must you do to the left side so the two sides are equal?

Books to Read

**Subtraction Action**
by Loreen Leedy

**How Many Feet? How Many Tails?**
by Marilyn Burns

**The Hershey’s Kisses Addition Book**
by Jerry Pallotta
Estimada familia:

Hoy mi clase comenzó el Capítulo 3: Álgebra: Usa la adición y la sustracción. Aprenderé a resolver ecuaciones de adición y sustracción, trabajare con ecuaciones e identificaré la información que sobra y que falta al resolver problemas. A continuación, están mis palabras de vocabulario y una actividad que podemos hacer juntos.

Cariños, _____________

Vocabulario clave

expresión Combinación de números, variables y símbolos de operaciones que representan una cantidad matemática. $3(x) = 27$

variable Letra o símbolo que se usa para representar una cantidad desconocida. $3(x) = 27$, $x$ es la variable

paréntesis Indican la operación que debes realizar primero. $12 - (7 + 2)$

ecuación Enunciado matemático que contiene el signo de igualdad, $=$, el que indica que el lado izquierdo del signo de igualdad tiene el mismo valor que el lado derecho. $4 + 5 = 9$

equilibrar Cuando la cantidad del lado izquierdo de una ecuación es igual a la cantidad del lado derecho, ambos lados están iguales y la ecuación está equilibrada. $5 + 1 + 5 = 6 + 2 + 3$

patrón Sucesión de números, figuras o símbolos que sigue una regla o un diseño. 2, 4, 6, 8

resolver Hallarle la respuesta a un problema. $4 ÷ 2 = 2$

Actividad

Coloquen 2 platos uno al lado del otro. Piensen en cada plato como si fuera un lado de una ecuación. Coloquen una moneda de 10¢ en cada plato. Agréguenle 3 monedas de 5¢ al plato izquierdo. Coloquen una moneda de 10¢ en el plato derecho. ¿Son iguales los valores en cada plato? Quiten una moneda de 10¢ de cada plato. ¿Cuáles son los nuevos valores? ¿Son iguales? ¿Qué deben hacerle al lado izquierdo para que los dos lados sean iguales?

Libros recomendados:

Subtraction Action de Loreen Leedy

How Many Feet? How Many Tails? de Marilyn Burns

The Hershey’s Kisses Addition Book de Jerry Pallotta
Anticipation Guide

Algebra: Use Addition and Subtraction

**STEP 1**  
*Before you begin Chapter 3*

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

<table>
<thead>
<tr>
<th><strong>STEP 1</strong></th>
<th><strong>Statement</strong></th>
<th><strong>STEP 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A, D, or NS</td>
<td></td>
<td>A or D</td>
</tr>
<tr>
<td>1.</td>
<td>Sometimes, it is necessary to use a variable when writing an expression.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>A variable is a letter or symbol that represents a known value.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>An expression can contain numbers and symbols.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>If an expression contains parentheses, you should perform the operation inside the parentheses first.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>An equation will always contain an equals sign (=).</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>In the equation (4 + x = 6), the value of the variable (x) is 3.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>There will never be extra information in a problem.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>An equation is balanced when the amount on the left side of the equation is equal to the amount on the right side of the equation.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>(2 \text{ dimes} + 10 \text{ pennies} = 7 \text{ nickels})</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>If (x = 2), (3 + x = 5).</td>
<td></td>
</tr>
</tbody>
</table>

**STEP 2**  
*After you complete Chapter 3*

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
CALCULATE THE CARDS

**Ready**
Deck of cards  
Paper and pencil

**Set**
Remove the face cards and jokers from the deck.

**GO!**
1. Deal 6 cards to each player.
2. Arrange the cards to create a subtraction problem.
3. Find your difference!
4. Award the player with the greatest difference 3 points.  
The player with the least difference receives 1 point.
5. Shuffle all the cards and deal again.
6. Continue play until one player reaches a score of 10 or more.

![Cards and subtraction problem example]
Reteach

**Addition and Subtraction Expressions**

A variable is a letter or symbol that represents an unknown number. In the expression $5 + x$, the unknown number is represented by the variable $x$.

You can find the value of an expression by substituting different numbers for the variable.

<table>
<thead>
<tr>
<th>Find the value of $5 + x$ when $x = 2$.</th>
<th>Find the value of $5 + x$ when $x = 5$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5 + x$</td>
<td>$5 + x$</td>
</tr>
<tr>
<td>$5 + 2 = 7$</td>
<td>$5 + 5 = 10$</td>
</tr>
<tr>
<td>So, the value of $5 + x$ when $x = 2$ is 7.</td>
<td>So, the value of $5 + x$ when $x = 5$ is 10.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Find the value of $m - 3$ when $m = 7$.</th>
<th>Find the value of $m - 3$ when $m = 10$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$m - 3$</td>
<td>$m - 3$</td>
</tr>
<tr>
<td>$7 - 3 = 4$</td>
<td>$10 - 3 = 7$</td>
</tr>
<tr>
<td>So, the value of $m - 3$ when $m = 7$ is 4.</td>
<td>So, the value of $m - 3$ when $m = 10$ is 7.</td>
</tr>
</tbody>
</table>

**Find the value of each expression if $m = 7$ and $s = 3$.**

1. $m + 1$ _____  
2. $s + 2$ _____  
3. $5 + s$ _____  
4. $3 + m$ _____  
5. $7 - m$ _____  
6. $19 - s$ _____

**Find the value of each expression if $b = 9$ and $e = 4$.**

7. $b + 3$ _____  
8. $b + 8$ _____  
9. $e + 4$ _____  
10. $e + 6$ _____  
11. $b - e$ _____  
12. $(e + 2) - 3$ _____
Skills Practice
Addition and Subtraction Expressions

Find the value of each expression if \( y = 6 \) and \( z = 2 \).

1. \( 9 - y \) _____
2. \( 7 - z \) _____
3. \( z + 3 \) _____
4. \( y + 7 \) _____
5. \( 3 + y \) _____
6. \( y - 1 \) _____
7. \( (12 - y) + 4 \) _____
8. \( 18 - (8 + z) \) _____
9. \( z + 17 \) _____
10. \( 12 + y \) _____
11. \( (5 + y) - 3 \) _____
12. \( (5 - z) + 9 \) _____

Write an expression for each situation.

13. 7 more than \( x \) ________________
14. 12 and \( y \) more ________________
15. 5 and \( p \) more ________________
16. 25 and \( b \) more ________________
17. 2 and \( m \) more ________________
18. 15 more than \( q \) ________________
19. 3 more than \( g \) ________________
20. 41 and \( f \) more ________________

Solve.
21. George earns $30 plus tips each day. Write an expression to show his total daily pay. If George received $8 in tips yesterday, how much did he earn in all?

22. Tanesha has 24 marbles. She gives away \( x \) number of marbles. Write an expression for the number of marbles she has left.
Find the value of each expression if $y = 7$ and $b = 2$.

1. $y + 6$
2. $b + 8$
3. $y - 2$
4. $14 - b$
5. $y + 18$
6. $12 + b$
7. $(y - 1) + 3$
8. $19 - (b + 3)$

Write an expression for each situation.

10. four more than $j$
11. $v$ minus fifteen
12. the sum of $k$ and twelve
13. twenty-three subtracted from $x$

Write an expression for each situation. Then find the value of the expression to answer the question.

14. John walks 5 minutes longer to school than Rosa. If Rosa walks 24 minutes to school, how long does John walk to school?
15. Caroline is 7 inches shorter than Kevin. Kevin is 56 inches tall. How tall is Caroline?

Find each difference. (Lesson 2-7)

16. $200 - 106 = $$$
17. $6,000 - 3,265 = $$$
18. $500 - 483 = $$$
19. $80.00 - $23.21 = $$
20. $7,000 - 5,936 = $$
21. $300 - 129 = $$
Solve.

1. Ming and Amy count the total number of beads they have. Ming has 21 beads. Write an expression to show the total number of beads that Ming and Amy have all together.

2. Julie has 16 paper clips. She gives away $x$ number of paper clips. Write an expression for the number of paper clips she has left.

3. Each week, Hector sends 2 E-mails to his friend Chet. He also sends E-mails to other friends each week. Write an expression to show how many E-mails Hector sends each week.

4. George and his brother have a total of 8 CDs. If George has $n$ CDs, write an expression to show how many CDs his brother has.

5. Delia saves $2 from her weekly allowance. She also saves the money she earns from delivering newspapers each week. Write an expression to show her total weekly savings. If she earns $5 delivering newspapers this week, how much money does she save in all this week?
Enrich

Matching Expressions

The stories below use words to express ideas about addition and subtraction. Most of them match an algebraic expression at the right. One algebraic expression does not match. Write the letter of an algebraic expression to match each story. Rewrite the incorrect algebraic expression to make it match.

1. Sally has more dollars than Angie, who has ten dollars.
   a. $31 - x$

2. Last month Brett read fewer books than his friend Bill, who read seven biographies.
   b. $12 + 12 + x$

3. Kim baked a dozen apple pies. Duane baked an equal number of apple pies, plus some cherry pies.
   c. $x + 20$

4. There are 24 hours in a day, but everyone spends some number of them sleeping.
   d. $1 + x$ or $x - 1$

5. Tom started out with seventy-six trading cards, but he ended up with only fifty-four.
   e. $76 - x = 54$

6. There are 31 days in January, but Heather only works some of the days.
   f. $7 - x$

7. Jennifer calls her Grandmother more than Raul, who calls his Grandmother once a week.
   g. $82 - x = 47$

8. Jacob had eighty-two rolls of wrapping paper to sell. After selling the paper, he had forty-seven rolls of paper left.
   h. $24 - x$
3–2

Reteach

Solve Equations Mentally

You can use mental math to solve equations.

<table>
<thead>
<tr>
<th>Addition Equations</th>
<th>Subtraction Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solve 3 + n = 7.</strong></td>
<td><strong>Solve 11 − n = 8.</strong></td>
</tr>
<tr>
<td>THINK 3 plus what number equals 7? Or 7 minus what number equals 3?</td>
<td>THINK 11 minus what number equals 8? Or 8 plus what number equals 11?</td>
</tr>
<tr>
<td>You know that 3 + 4 = 7 and 7 − 4 = 3.</td>
<td>You know that 11 − 3 = 8 and 8 + 3 = 11.</td>
</tr>
<tr>
<td>So, n = 4.</td>
<td>So, n = 3.</td>
</tr>
</tbody>
</table>

Solve each equation mentally.

1. \(5 + n = 8\)  
2. \(7 − n = 5\)  
3. \(2 + n = 10\)  
4. \(n − 4 = 6\)  
5. \(n + 4 = 6\)  
6. \(n − 8 = 1\)  
7. \(n + 6 = 10\)  
8. \(14 − n = 6\)  
9. \(6 + n = 13\)  
10. \(n − 2 = 13\)  
11. \(n + 9 = 12\)  
12. \(17 − n = 11\)  
13. \(8 + n = 14\)  
14. \(15 − n = 4\)  
15. \(11 + n = 18\)  
16. \(19 − n = 13\)  
17. \(n + 12 = 20\)  
18. \(n − 11 = 11\)  
19. \(n + 7 = 16\)  
20. \(20 − n = 13\)
Solve each equation mentally.

1. \( n + 6 = 12 \) 
2. \( n - 6 = 3 \) 
3. \( 4 + n = 7 \) 
4. \( n - 5 = 10 \) 
5. \( n + 6 = 15 \) 
6. \( 12 - n = 1 \) 
7. \( n + 9 = 13 \) 
8. \( 18 - n = 9 \) 

9. \( 10 + n = 18 \) 
10. \( n - 4 = 12 \) 
11. \( 7 + n = 20 \) 
12. \( 20 - n = 13 \) 
13. \( 5 + n = 16 \) 
14. \( n - 8 = 4 \) 
15. \( n + 11 = 23 \) 
16. \( n - 12 = 13 \)

Write and solve an equation for each situation.

17. A number plus 5 equals 18.

18. The sum of 6 and a number is 21.

19. Nine less than a number equals 7.


Solve.

21. Melinda has $12 in her pocket. She bought a card at the store and now has $8. Write and solve an equation to find how much the card cost.
Solve each equation mentally.
1. $3 + d = 11$  
2. $f + 4 = 10$  
3. $13 - h = 4$  
4. $j - 2 = 19$  
5. $6 + m = 17$  
6. $15 - r = 2$  
7. $20 = t + 7$  
8. $9 = w - 12$  
9. $12 = 3 + z$  
10. $17 - b = 4$

Write and solve an equation for each situation.
11. A number plus 5 equals 13. What is the number?
   
12. Twelve less than a number equals 25. What is the number?
   
13. The sum of 4 and a number is 27. What is the number?
   
14. Seven subtracted from a number is 15. What is the number?

Spiral Review
Find the value of each expression if $x = 6$ and $c = 4$. (Lesson 3-1)
15. $x + 3$  
16. $c + 12$  
17. $x - 5$  
18. $10 + c$  
19. $(x - 2) + 7$  
20. $22 - (c + 3)$

Write an expression for each situation.
21. seven more than $d$
22. $w$ minus 12
23. the sum of $f$ and seventeen
24. twenty-one subtracted from $p$
Solve Equations Mentally

Write and solve an equation for each situation.

1. Tad had $10. He spent some of his money on a model car. If Tad has $4 left, how much money did the model car cost?

2. A large puzzle costs $12. A small puzzle and a large puzzle together cost $18. How much would you pay for 1 small puzzle?

3. Nadine bought some new CDs. She has 15 other CDs. She now has 20 CDs. How many CDs did she buy?

4. Emma collected 18 rocks. She gave some to her sister. Emma has 12 rocks left. How many rocks did she give her sister?

5. Tony rented some movies. He watched 2 movies over the weekend. He has 6 movies left. How many movies did Tony rent?

6. Kameko scored 12 points in the first half of a basketball game. At the end of the game, he had a total of 25 points. How many points did Kameko score in the second half of the game?

7. Laura planted 20 flowers in her garden. A rabbit ate some of the flowers. Laura has 11 flowers left. How many flowers did the rabbit eat?
Add and subtract mentally to solve these rhyming riddles. Write only the answer on each line.

1. Take the number of hours in a day
   Plus a dozen words to say
   ________

2. Start with the number of months in one year
   Add the legs found on one deer
   ________

3. Four plus seven
   Now add eleven
   ________

4. Take the number of fingers on one hand
   Plus all the states in this great land
   ________

5. Count the toes on two feet
   Add the t’s found in retreat
   ________

6. Start with the number of days in a week
   Minus the number of letters in the word seek
   ________

Now write a rhyming riddle of your own and trade with a partner to check your answers. Think about rhyming words like flag and bag, door and more, eight and skate.
A problem is **missing information** when you cannot solve it unless you have more information. A problem has **extra information** when it gives more information than needed to solve it.

### Missing Information

**Problem**  Jack spent 45 minutes on his homework. Jenny started her homework at 4:00 P.M. Who spent more time doing their homework, Jack or Jenny?

You cannot solve the problem unless you know when Jenny finished her homework.

### Extra Information

**Problem**  Sue spent 30 minutes raking leaves after school. She spent 20 minutes raking leaves after dinner. She then practiced her violin for 30 minutes. How long did Sue take to rake the leaves?

To solve the problem, you do not need to know how long it took Sue to practice.

**Choose the correct answer.**

The music store is having a sale on CDs. The store also sells videos. The cost is $15 for 5 CDs. How many CDs can Tyler buy?

1. Which of the following statements is false?
   - A. There are more than 20 CDs on clearance.
   - B. It costs $15 for 5 videos.
   - C. It costs $30 for 10 CDs.
   - D. One CD on sale costs $3.

2. What information is missing?
   - F. the cost of each CD
   - G. what the store sells
   - H. how much money Tyler has
   - J. what Tyler wants to buy
Thirty fourth-grade students are going to a museum. Each van can hold ten students. Five chaperones are going on the trip with the students. How many vans are needed to take the students to the museum?

3. What information is not needed?
   A. the number of students
   B. the number of chaperones
   C. the number of students that can fit in each van
   D. none of the above

4. How many vans are needed?
   F. 5 vans
   G. 4 vans
   H. 3 vans
   J. 2 vans

Circle the question in each problem. Underline the needed facts. Identify the missing or extra information. Then solve if possible.

5. Sally eats three turkey sandwiches and two ham sandwiches a week. She eats at 12:30 every day. How many turkey sandwiches does she eat in two weeks?

6. Jill is 9 years old and she downloads 10 songs a month. How much does she spend after 3 months?

7. There are a total of 30 students. Twelve of them want chocolate ice cream. How many of them prefer strawberry?
Identify any extra or missing information. Then solve if possible.

1. A round-trip first-class ticket from St. Louis to San Diego costs $1,600. A round-trip coach ticket costs $359. The Howards buy 3 tickets. How much do they spend?

2. Marsha and Vicki are selling lemonade. Each pitcher of lemonade can fill 10 cups. Each cup is 25 cents. If they sell 30 cups, how many pitchers of lemonade must they make?

3. The Smith family is going to the zoo on Saturday. Admission for adults is $12. Admission for children is $5 less. How much will admission to the zoo cost the Smith family?

4. Sam runs 2 miles every day after school. He runs 5 miles on Saturday and does not run on Sunday. He also has basketball practice on Saturday. How many miles does Sam run over 2 weeks?

Solve. Use any strategy.

5. Denzel has 3 rows of shelves in his bedroom. Books, games, or CDs occupy each shelf. The middle shelf holds CDs. If the top shelf does not hold books, which shelf holds games?

Strategy: ________________________________

6. Arlene spent $30 for a jacket. She now has $5 left. How much money did Arlene have before she bought the jacket?

Strategy: ________________________________
Identify any missing or extra information. Then solve if possible.

1. At the kennel, the staff walks each dog 2 times per day. They walk 3 dogs at a time. How many dogs do they take for a walk each day?

2. Each week, Michelle will invite 1 girl from her class to come home with her. There are 17 boys in her class and 16 (including Michelle) girls. How many weeks will it take to invite every girl in her class?

3. Patrick loves vegetables. Every day for school he packs a small bag of carrots, a small bag of celery, and a small bag of broccoli. He also likes apple juice. How many small bags of vegetables does Patrick bring to school in a week?

4. Nicole wants to buy a turkey sandwich, chips, and a bottle of water for lunch. She has $5.00 with her. Does she have enough?

Solve each equation mentally. (Lesson 3-2)

5. $5 + d = 9$
6. $f + 7 = 20$
7. $16 - h = 5$
8. $j - 7 = 12$
9. $5 + m = 14$
10. $22 - r = 7$
11. $24 = t + 6$
12. $12 = w - 11$
13. $9 = 4 + z$
14. $18 = 11 + t$
Libby wants to paint her bedroom, which is 9 feet by 12 feet, three different shades. She wants the bottom half of the walls to be a dark blue color. She picked a bright shade of pink for a 6 inch wide band just above the dark blue. Libby wants the rest of each wall to be pale pink all the way to the ceiling. How much wider is the pale pink band than the bright pink 6 inch band?

1. What information is given that would help you answer the question?

2. What information is needed but missing?

3. Choose a likely number for the missing information and use it to estimate an answer.

4. Paint is sold in 1-gallon containers. One gallon of paint covers about 350 square feet of wall. Suppose the dark blue paint costs $17.95 per gallon, the bright pink paint costs $18.33 per gallon, and the pale pink paint costs $18.99 per gallon. Using your estimate from problem 3, calculate the cost of painting Libby’s bedroom.
Sometimes math exercises have a pattern to the answers. Once you find the pattern, you can make a rule that will solve the problem for any input.

Use this problem to learn more about finding a pattern and making a rule:

**No matter how many cards Emma has, James always has five more cards.**

This problem tells you the rule: Emma’s cards + 5 = James’ cards. If Emma has 15 cards, how many cards will James have? James will have 15 + 5, or 20 cards.

Now see the same problem written a different way.

<table>
<thead>
<tr>
<th>Emma’s Cards Input (x)</th>
<th>James’ Cards Output (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>?</td>
</tr>
<tr>
<td>9</td>
<td>?</td>
</tr>
</tbody>
</table>

1. Identify the pattern: 3 + __ = 8
   5 + __ = 10
   The pattern is to add 5 to each number.

2. Identify the rule and write it as an equation.
   \( x + 5 = y \)
   So the next numbers in the table are 12 and 14.

**Practice**

Write each rule as an equation to describe the pattern. Then use the equation to find the next three numbers in the pattern.

1. **Rule:**
<table>
<thead>
<tr>
<th>Input (d)</th>
<th>Output (e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

2. **Rule:**
<table>
<thead>
<tr>
<th>Input (j)</th>
<th>Output (k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
**Skills Practice**

*Algebra: Find a Rule*

Write an equation that describes the pattern. Then use the equation to find the next two numbers in the pattern.

1. | Rule: ______ |
   | Input ($a$) | Output ($b$) |
   | 0          | 2            |
   | 5          | 7            |
   | 10         | 12           |
   | 15         |              |
   | 20         |              |

2. | Rule: ______ |
   | Input ($f$) | Output ($g$) |
   | 22          | 17           |
   | 26          | 21           |
   | 30          | 25           |
   | 34          |              |
   | 38          |              |

3. | Rule: ______ |
   | Input ($h$) | Output ($j$) |
   | 12          | 19           |
   | 15          | 22           |
   | 18          | 25           |
   | 21          |              |
   | 24          |              |

4. | Rule: ______ |
   | Input ($t$) | Output ($u$) |
   | 25          | 14           |
   | 29          | 18           |
   | 33          | 22           |
   | 37          |              |
   | 41          |              |

This table shows how much a drive-in movie theater charges.

5. The drive-in movie theater charges $7 per car plus $1 per person. Use the table to the left to write an equation for this situation.

   ______

6. Find the cost for bringing 4, 5, and 6 people to the movies.

   ______
Complete the input/output table for each equation.

1. Rule: \( e + 7 = f \)

<table>
<thead>
<tr>
<th>Input (e)</th>
<th>Output (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Rule: \( g - 4 = h \)

<table>
<thead>
<tr>
<th>Input (g)</th>
<th>Output (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. A dance studio offers lessons to students. It costs $25 to rent the studio plus $1 per student. Use the table to write an equation for this situation.

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>$27</td>
</tr>
<tr>
<td>4</td>
<td>$29</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

4. Find how much it will cost if 6, 8, and 10 students take lessons.

Spiral Review: Identify any missing or extra information. Then solve if possible. (Lesson 3-3)

5. Every day Pedro wears a different baseball cap to school. He has red hats, black hats, and blue hats. How many weeks will it take for him to wear all of his hats?
The table shows how many people will be going on a field trip.

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>31</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

1. Jessica’s class is going on a field trip. The school will bring all the students who are there that day plus 4 chaperones. Use the table to write an equation for this situation. ____________

2. Find how many people will go if there are 31 and 33 students going. ____________

3. Write a new equation if the school will bring the students and 6 chaperones. ____________

4. Create a table for the new equation. How many people will go if 35 students go on the trip?
Continue each pattern. Then write the function that makes it work. Here is an example.

0, 5, 10, 15, ______, _______, _______
The function is \( x + 5 \)

1. 3, 9, 15, 21, ______, _______, _______
The function is _______

2. 72, 68, 64, 60, ______, _______, _______
The function is _______

3. 39, 49, 59, 69, ______, _______, _______
The function is _______

4. 28, 35, 42, 49, ______, _______, _______
The function is _______

5. 81, 72, 63, 54, ______, _______, _______
The function is _______

6. 25, 33, 41, 49, ______, _______, _______
The function is _______

7. 93, 88, 83, 78, ______, _______, _______
The function is _______

8. 41, 45, 49, 53, ______, _______, _______
The function is _______
There are many ways to solve most math problems. You will decide which strategy works best for you when you read the problems. Here is a list of problem-solving strategies:

- **Draw a picture:** This strategy can help you look at the information in the problem a different way—useful when the problem is about distance or location.
- **Look for a pattern:** This strategy can help you solve problems when the input changes.
- **Make a table:** This strategy can help you solve problems that have a lot of information to organize.

**Use this problem to learn more about choosing a strategy.**

When Lilly was 7 years old, she earned an allowance of $0.75. When she was 8 years old, she earned $1.25, and when she was 9 years old, she earned $1.75. Now Lilly is 10 years old. If the pattern continues how much allowance does Lilly earn?

<table>
<thead>
<tr>
<th>Understand</th>
<th>You know that Lilly earned $0.75 when she was 7, $1.25 when she was 8, and $1.75 when she was 9. You need to find how much allowance Lilly earns as a 10-year-old.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Choose a strategy. The input (Lilly’s age) is changing. Looking for a pattern in the output (Lilly’s allowance) will help you find the answer. Look for a pattern to solve this problem.</td>
</tr>
</tbody>
</table>
Reteach (continued)

Problem-Solving Investigation

<table>
<thead>
<tr>
<th>Solve</th>
<th>Age</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance</td>
<td>$0.75</td>
<td>$1.25</td>
<td>$1.75</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

Look at the three numbers. How do you get from $0.75 to $1.25? How do you get from $1.25 to $1.75? Is there a rule that tells how to get from one number to the next?

Since the numbers are getting bigger, an amount is being added to each number. Use subtraction to find the amount being added.

\[
\begin{align*}
$1.25 - $0.75 &= $0.50 \\
$1.75 - $1.25 &= $0.50
\end{align*}
\]

Fifty cents was added to each number. Add $0.50 to $1.75 to find the answer.

\[
\begin{align*}
$1.75 + $0.50 &= $2.25
\end{align*}
\]

Lilly’s allowance is now $2.25.

| Check | Look back at the problem. Check that the difference between $2.25 and $1.75 is $0.50. $2.25 - $1.75 = $0.50 Your answer is correct. |

Use any strategy on p. 28 to solve. Tell which strategy you used.

1. Each farmer brought 3 animals to the fair. If the fair has space in one barn for 24 animals, how many farmers can bring animals to that barn? ________________

   Strategy: ________________________________

2. Mackenzie is buying breakfast at school. Pancakes are $1.75, milk is $0.85, and eggs are $2.25. Mackenzie orders all three items. If she pays with a $10.00 bill, how much change will she get back?

   ________________________________

   Strategy: ________________________________
Skills Practice
Problem-Solving Investigation

Use any strategy shown below to solve. Tell which strategy you used.

• Draw a picture • Make a table
• Look for a pattern

1. When the new apartment building opened, 12 families moved in. If each family averaged 2 children, about how many children live in the new building? ________________
   Strategy: ____________________________________________

2. Luis spent $12.50 on groceries for his family. He bought eggs, milk, bananas, and bread. If he paid with a $20-bill, how much change did he get back? ________
   Strategy: ____________________________________________

3. Olivia is making bead bracelets. She places two blue beads, then a green bead and a yellow bead. How many blue beads will she need if she uses 47 beads in all? ________________
   Strategy: ____________________________________________

4. Adam is helping his grandmother make a quilt. For every green square she uses, she needs 2 red squares, 3 yellow squares, and 4 white squares. If she uses 4 green squares, how many squares will she need in all? ________________
   Strategy: ____________________________________________

5. Madeline wants to download songs that cost $2 each. If she has $15, how many songs can she download? ________
   Strategy: ____________________________________________

6. Erin picks up golf balls at the local golf course. Today she has collected 45 white balls, 17 yellow balls, 12 orange balls, and 5 pink balls. How many golf balls has Erin collected?
   ____________________________________________
Use any strategy shown below to solve. Tell which strategy you used.

- Draw a picture
- Make a table
- Look for a pattern

1. Allison can read 4 pages of her book in 8 minutes. How many minutes will it take her to read 16 pages of her book?

Strategy: ________________________________

2. Richard can clean his room in 22 minutes. Corey can clean his room in 25 minutes, and Brooke can clean her room in 21 minutes. If they have to clean their rooms twice a week, how many minutes do all three spend cleaning their rooms each week?

Strategy: ________________________________

3. Complete the number pattern.
   45, 43, 42, 40, 39, ____, ____, ____, ____

Strategy: ________________________________

Spiral Review

Create an input/output table for each equation. (Lesson 3-4)

4. \( e + 5 = f \)

   \[ \begin{array}{c|c}
   \text{Input (e)} & \text{Output (f)} \\
   \hline
   & \\
   & \\
   & \\
   & \\
   \end{array} \]

5. \( g - 8 = h \)

   \[ \begin{array}{c|c}
   \text{Input (g)} & \text{Output (h)} \\
   \hline
   & \\
   & \\
   & \\
   & \\
   \end{array} \]
Joe, Bob, and I went to the talent show. We counted performers that we know. Joe, who is known to use his head, said, “All but two of them wore red.”

Bob, who is a clever fellow, said, “All but two of them wore yellow.” And I, with 20-20 sight, could see that all but two wore white.

Use any strategy to answer the questions.

1. How many performers were counted? ________________

2. Explain your thinking.
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

3. Find as many ways as you can to show the number 90, using three numbers and at least two operations.
   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

4. The product of two numbers is 2,400. One number is 20 more than the other. What are the two numbers? ________________
Reteach

Balanced Equations

Equations are balanced when both sides are equal (=). They are not balanced when the two sides are not equal (≠).

Think about holding a pencil in one hand and something heavier, like your math book, in the other hand. You can tell that they are not the same weight.

\[
\text{pencil} \neq \text{math book}
\]

If the two sides have the same totals, they are equal. They are equal even if the numbers on each side are different:

\[
1 + 7 + 2 = 5 + 5 \\
10 = 10
\]

Sometimes you have to figure out what number to add or subtract from one side to make the two sides equal, or balanced.

\[
1 + 7 + \_ = 5 + 5 \\
8 + \_ = 10
\]

You need to add 2 to the left side to equal 10.

\[
1 + 7 + 2 = 5 + 5
\]

**Complete each equation to make a balanced equation.**

1. 5 nickels + 3 dimes = 2 quarters + _________________
2. 2 dimes + 15 pennies = 3 nickels + _________________
3. 5 dimes – _________________ = 5 nickels + 15 pennies
4. 4 dimes – 6 pennies – 3 nickels = 6 dimes – 8 nickels – __________

**Tell whether each pair of expressions will form a balanced equation.**

5. \(4 + 5\) \(6 + 3\)
6. \(6 + 12\) \(9 + 8\)
7. \(14 - 8\) \(2 + 4\)
Skills Practice
Balanced Equations

Complete each equation to make a balanced equation.

1. \(14 + 5 = 14 + \underline{\phantom{0}}\)

2. \(21 + 8 = 10 + 11 + \underline{\phantom{0}}\)

3. \(36 + 9 = 15 + 21 + \underline{\phantom{0}}\)

4. \(44 + 7 = 20 + 24 + \underline{\phantom{0}}\)

Tell whether each pair of expressions will form a balanced equation.

5. \(12 + 8\)

6. \(5 + 17\)

7. \(3 + 11 - 5\)

8. \(6 + 7 + 9\)

Use the table to help answer these questions.

<table>
<thead>
<tr>
<th>Family Member</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grandmother</td>
<td>75</td>
</tr>
<tr>
<td>Aunt Ilene</td>
<td>48</td>
</tr>
<tr>
<td>Ethan</td>
<td>27</td>
</tr>
<tr>
<td>Justin</td>
<td>23</td>
</tr>
<tr>
<td>Lexi</td>
<td>5</td>
</tr>
<tr>
<td>Steve</td>
<td>4</td>
</tr>
</tbody>
</table>

9. The sum of Aunt Ilene’s and Ethan’s ages equals the age of another family member. Write an equation for this situation.

\(\underline{\phantom{0}}\)

10. Whose age will balance the equation?

\[\text{Grandmother} = \text{Aunt Ilene} + \text{Justin} + \underline{\phantom{0}}\]
Find the missing number in each equation.

1. $7 + 5 = 7 + \underline{\hspace{1cm}}$
2. $12 + 9 = 12 + \underline{\hspace{1cm}}$
3. $15 + 6 = 4 + 11 + \underline{\hspace{1cm}}$
4. $20 + 8 = 13 + 7 + \underline{\hspace{1cm}}$
5. $36 + 3 = 20 + 16 + \underline{\hspace{1cm}}$
6. $27 + 6 = 15 + 12 + \underline{\hspace{1cm}}$
7. $48 + 4 = 22 + 26 + \underline{\hspace{1cm}}$
8. $16 + 9 = 8 + \underline{\hspace{1cm}} + 9$

9. Tyrone spins a spinner numbered 0 through 5. He spins a 3 and a 5 for a total of 8 points. Gloria spins a 5 on her first try. What number does Gloria need to spin to get a total equal to Tyrone? \underline{\hspace{1cm}}

10. Bonnie earned $14 and $18 dollars the last two times she babysat. Kara earned $10 and $4 the last two times she babysat. How much more money does Kara need to earn to equal the total amount Bonnie earned? \underline{\hspace{1cm}}

Spiral Review

Use any strategy shown below to solve. Tell which strategy you used. (Lesson 3-5)

- Draw a picture
- Look for a pattern
- Make a table

11. Sarah can make 4 sandwiches in 10 minutes. If Sarah needs to make 16 sandwiches for a picnic, how long will it take her? \underline{\hspace{1cm}}

12. Josh, Kayla and Anthony are volunteering at the pool for the summer. Josh can fold 3 towels in 10 minutes. Kayla can fold 5 towels in 10 minutes, and Anthony can fold 7 towels in 10 minutes. If they all fold towels together, how many towels can they fold in one hour? \underline{\hspace{1cm}}
The table below shows the price of David’s favorite activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>skate park</td>
<td>$4</td>
</tr>
<tr>
<td>movies</td>
<td>$9</td>
</tr>
<tr>
<td>go-carts</td>
<td>$13</td>
</tr>
<tr>
<td>pizza dinner</td>
<td>$17</td>
</tr>
<tr>
<td>amusement park</td>
<td>$34</td>
</tr>
</tbody>
</table>

1. The sum of going to the skate park and go-carting equals the price of another activity. Write an equation for this situation.

2. David picks a movie and pizza dinner. His friend picks a movie and go-carts. Write an equation for this situation. Tell if it balanced.

The table below shows how many students voted for each activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>kickball</td>
<td>12</td>
</tr>
<tr>
<td>pizza lunch</td>
<td>15</td>
</tr>
<tr>
<td>extra recess</td>
<td>20</td>
</tr>
<tr>
<td>art time</td>
<td>8</td>
</tr>
</tbody>
</table>

3. The difference in votes between extra recess and art time equals the votes for another activity. Write an equation for this situation.

4. One class votes 6 for kickball and 14 for pizza. Another class votes 7 for art time and 11 for extra recess. Write the equation for this situation. Tell whether the equation is balanced.
Each letter in the word above is worth the number of points shown. Use the letters in the word “equations” to make at least 10 words, each worth a total of 25 points or more. You may not use any of the letters more than once in each word. Write an equation to show the value of each word.

For example, the word squint is worth 1 + 10 + 7 + 6 + 12 + 8 = 44

1. _______________________________________________________________________

2. _______________________________________________________________________

3. _______________________________________________________________________

4. _______________________________________________________________________

5. _______________________________________________________________________

6. _______________________________________________________________________

7. _______________________________________________________________________

8. _______________________________________________________________________

9. _______________________________________________________________________

10. ______________________________________________________________________
## Individual Progress Checklist

<table>
<thead>
<tr>
<th>B</th>
<th>D</th>
<th>S</th>
<th><strong>Goal</strong></th>
<th><strong>Progress</strong></th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Write and find the values of expressions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solve addition and subtraction equations.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Find a rule and develop an equation.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Balance addition and subtraction equations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Identify extra and missing information when solving problems.</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

________________________________________________________________________

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Chapter Diagnostic Assessment

Find the missing number.
1. \(4 + \_ = 10\)
2. \(\_ + 6 = 8\)
3. \(\_ + 10 = 15\)
4. \(3 + \_ = 9\)
5. \(1 + \_ = 8\)
6. \(\_ + 5 = 12\)
7. Fill in the missing part of the number sentence \(9 + 3 + \_ = 17\)

Find the value of each number sentence.
8. \(6 + 2 + 1 = \_\)
9. \(3 + 7 + 2 = \_\)
10. \(2 + 5 - 1 = \_\)
11. \(8 - 3 + 8 = \_\)
12. \(9 + 3 - 2 = \_\)
13. \(5 - 5 + 10 = \_\)

Identify each pattern. Then find the next number in the pattern.
14. 2, 4, 6, 8, 10
15. 5, 10, 15, 20, 25
16. 20, 17, 14, 11, 8

17. Marta’s mom is collecting blankets for disaster relief. She needs 4 blankets for each emergency kit. How many blankets will she need for 12 kits?

<table>
<thead>
<tr>
<th>Emergency Kits</th>
<th>Blankets</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8</td>
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<tr>
<td>4</td>
<td>16</td>
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<td>6</td>
<td>24</td>
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<td>8</td>
<td>32</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
Chapter Pretest

Find the value of each expression if \( a = 3 \) and \( z = 7 \).

1. \( a + 20 = \) _____
2. \( 17 - z = \) _____
3. \( 40 - a = \) _____
4. \( (z + 9) - 1 = \) _____
5. \( 25 - (5 + a) = \) _____
6. \( z - (12 - 5) = \) _____

Write an expression for each situation and answer the question.

7. Kendra arrives at school five minutes after Paulina. If it takes Paulina 20 minutes to walk to school, how long does it take Kendra to get to school?

8. Hugo has 45 fewer baseball cards than David, who has 136 cards in his collection. How many baseball cards does Hugo have?

9. There are 8 slices in a large pizza. After Marley ate some pizza, only 5 slices were left. How many slices did Marley eat?

Identify any missing or extra information. Then solve if possible.

10. Beta the fish eats five flakes of tropical food every week. He eats at 5 P.M. each day. How many flakes of food does he eat in a month?

11. Olivia and her sister want to go to the ballet. The show begins at 7 P.M. How much will it cost for both of their tickets?

Tell whether each equation is balanced or not balanced.

12. \( 5 + 21 = 3 + 4 + 8 \) _________________
13. \( 13 + 8 + 2 - 6 = 12 + 5 \) _________________
Quiz 1 (Lessons 3-1 through 3-2)

Find the value of each expression if \( z = 7 \) and \( c = 2 \).

1. \( 15 - c \) ______
2. \( z + 11 \) ______

Write an expression for each situation.

3. twenty-four minus \( q \) ______
4. \( h \) plus eighteen ______

Solve each equation mentally.

5. \( 16 - g = 8 \) ______
6. \( 14 = h - 3 \) ______

7. \( 15 + j = 20 \) ______
8. \( 36 = m + 7 \) ______

Write an expression for each situation.

9. The sum of a number and 12 is 21. What is the number?

10. A number minus 50 is 50. What is the number?

Write an expression for each situation. Find the value of the expression to answer the question.

11. Matt’s pizza has 11 more slices of pepperoni than Emily’s pizza. If Emily’s pizza has 21 slices of pepperoni, how many does Matt’s pizza have?

Write and solve an equation for each situation.

12. Colin’s mother made 34 cookies for his class. When he got to class, there were 27 cookies. How many cookies were missing?
Write each rule as an equation to describe the pattern. Then use the equation to find the next three numbers in the pattern.

1. Rule: 
   | Input (a) | Output (b) |
   | 2        | 9          |
   | 5        | 12         |
   | 8        |            |
   | 11       |            |
   | 14       |            |

2. Rule: 
   | Input (f) | Output (g) |
   | 8         | 5          |
   | 12        | 9          |
   | 16        |            |
   | 20        |            |
   | 24        |            |

Complete the input/output table for each equation.

3. Rule: \( t + 7 = v \)
   | Input (t) | Output (v) |
   | 10        | 12          |
   | 15        | 27          |
   | 25        |             |

4. Rule: \( w - 5 = x \)
   | Input (w) | Output (x) |
   |           | 7           |
   |           | 15          |
   |           | 13          |
   |           | 16          |
   |           | 24          |

Identify any missing or extra information. Then solve if possible.

5. Brittany spends 17 more minutes on homework than her brother does. She usually has math homework. If her brother spends 25 minutes on his homework, how long does Brittany spend on her homework? 

6. Joe brought a container of grapes in his lunch. There were 56 grapes in the container at the start of lunch. Joe prefers red grapes to green grapes. How many grapes were left when he finished eating?
Find the missing number in each equation.

1. $14 + 5 = 14 + \underline{\quad}$
2. $17 + 8 = 9 + 8 + \underline{\quad}$
3. $24 + 9 = 12 + 12 + \underline{\quad}$
4. $30 + 4 = 12 + 18 + \underline{\quad}$

Tell whether each pair of expressions will form a balanced equation.

5. $22 + 6 = 10 + 18$
6. $20 + 16 = 13 + 7 + 15$
7. $15 + 13 = 8 + 7 + 13$

Use any strategy shown below to solve. Tell which strategy you used.

- Draw a picture
- Look for a pattern
- Make a table

8. Alexis spends 12 minutes more than her sister Taylor getting dressed in the morning. If Taylor spends 11 minutes getting dressed, how long does Alexis spend getting dressed?

______________________________

Strategy: ____________________________

9. Zack is making cupcakes for a picnic. He should make enough so that each person has at least 1 cupcake. If 40 people come to the picnic, how many dozens of cupcakes does Zack need to make?

______________________________

Strategy: ____________________________
Read each question carefully. Write your answer on the line provided.

1. Find the value of this expression if \( z = 5 \).
   \[ (z + 6) - 8 \]
   (A) 11  (B) 3  (C) 7  (D) 5

2. Find the value of this expression if \( m = 4 \).
   \[ (5 + 3) - m \]
   (A) 6  (B) 8  (C) 4  (D) 5

3. Solve this equation mentally.
   \[ j + 6 = 14 \]
   (A) \( j = 8 \)  (B) \( j = 10 \)  (C) \( j = 5 \)  (D) \( j = 6 \)

Write an expression for each situation.

4. 6 more than \( b \) ________

5. \( n \) minus 12 ________

6. seven subtracted from \( p \) ________

7. the sum of eighteen and \( w \) ________

Solve each equation mentally.

8. \( 15 + g = 22 \) ________  

9. \( h + 4 = 18 \) ________  

10. \( 6 = 13 - f \) ________

11. \( 2 = r - 7 \) ________

Identify any missing or extra information. Then solve if possible.

12. James had 15 pencils at the beginning of the school year. He had 6 red, 6 yellow, and 3 blue pencils. At the end of the year, James had 3 pencils left. How many pencils did James use this year?

13. Maria’s friends all live close enough to walk to their homes. Rosa lives 8 minutes farther than Jane lives. How long does it take to get to Rosa’s house?
Vocabulary Test

Match each word to its definition. Write your answers on the lines provided.

1. expression _____  A. when the amount on the left side of an equation is the same as the amount on the right side, both sides are equal

2. variable _____  B. a combination of numbers, variables, and operation symbols that represents a mathematical quantity

3. parentheses _____  C. a mathematical sentence that contains an equals sign, =, indicating that the left side of the equal sign has the same value as the right side

4. equation _____  D. a sequence of numbers, figures, or symbols that follows a rule or design

5. balance _____  E. a letter or symbol used to represent an unknown quantity

6. pattern _____  F. tell you which operation to perform first

7. solve _____  G. find the answer to a problem
Oral Assessment

Place 4 blue paper clips, 8 red paper clips, a paper cutout of the letter “X,” a paper cutout of a minus sign, a paper cutout of a plus sign and a paper cutout of an equals sign on the table. 4 blue paper clips will always be used. “X” will represent the number of red paper clips used. Use the materials to formulate the equations below.

Read each question aloud to the student. Then either record the student’s answers on the lines below the question, or have them write answers on another piece of paper.

1. How many blue paper clips are there?

2. What is $4 + x$ if $x = 5$?

3. What is $4 + x$ if $x = 8$?

4. Tell how you got your answer.

5. If you took 2 blue paper clips away, what is $2 + x$ if $x = 3$?

6. Tell how you got your answer.

7. Sam earned 13 points total in a game. The first half of the game he earned 8 points. How many points did he earn in the second half of the game? In this case, $n = 8$. What is the value of $13 - n$ if $n = 8$?

8. What is the value of $13 - n$ if $n = 6$?
9. Tell how you got your answer.

____________________________________________________________________

____________________________________________________________________

10. What is the value of $3 + n$ if $n = 3$?

______________

11. Tell how you got your answer.

____________________________________________________________________

____________________________________________________________________

12. What is the value of $3 + n$ if $n = 0$?

______________

13. What is the value of $3 + n$ if $n = 1$?

______________

14. Tell how you got your answer.

____________________________________________________________________

____________________________________________________________________
## Chapter Project Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Student successfully completed the chapter project. Student demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>2</td>
<td>Student completed the chapter project with partial success. Student partially demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>1</td>
<td>Student did not complete the chapter project or completed it with little success. Student demonstrated very little appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>0</td>
<td>Student did not complete the chapter project. Student demonstrated inappropriate use of chapter information in completing the chapter project.</td>
</tr>
</tbody>
</table>
# Chapter Foldables Rubric

**Pocket Chart Foldables**  
**Algebra: Use Addition and Subtraction**

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 3     | Student properly assembled Foldables according to instructions.  
Student recorded information related to the chapter in the manner directed by the Foldables.  
Student used the Foldables as a study guide and organizational tool. |
| 2     | Student exhibited partial understanding of proper Foldables assembly.  
Student recorded most but not all information related to the chapter in the manner directed by the Foldables.  
Student demonstrated partial use of the Foldables as a study guide and organizational tool. |
| 1     | Student showed little understanding of proper Foldables assembly.  
Student recorded only some information related to the chapter in the manner directed by the Foldables.  
Student demonstrated little use of the Foldables as a study guide and organizational tool. |
| 0     | Student did not assemble Foldables according to instructions.  
Student recorded little or no information related to the chapter in the manner directed by the Foldables.  
Student did not use the Foldables as a study guide and organizational tool. |
Chapter Test, Form 1

Read each question carefully. Write your answer on the line provided.

1. What is the value of $18 + d$, if $d = 4$?
   - A. 4
   - B. 14
   - C. 18
   - D. 22

2. What number makes the sentence true?
   $8 + x = 13$
   - F. 3
   - G. 5
   - H. 6
   - J. 7

3. What is the value of this expression if $z = 8$?
   $(z - 3) + 5$
   - A. 10
   - B. 13
   - C. 8
   - D. 16

4. Jenna scored 23 points higher than Abby on her spelling test. If Abby’s score is 71, what is Jenna’s score?
   - F. 95
   - G. 94
   - H. 90
   - J. 80

5. A number plus 9 equals 17. What is the number?
   - A. 6
   - B. 7
   - C. 8
   - D. 9

6. Eight subtracted from a number equals 15. What is the number?
   - F. 7
   - G. 27
   - H. 25
   - J. 23

7. Angie delivered 16 newspapers during her first hour of work. By the end of her second hour of work, she had delivered 28 newspapers. How many newspapers did Angie deliver during the second hour?
   - A. 14
   - B. 20
   - C. 12
   - D. 16

8. Determine the next three numbers in the pattern.

<table>
<thead>
<tr>
<th>Input (v)</th>
<th>Output (w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>18</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>
   - F. 26, 32, 37
   - G. 27, 30, 33
   - H. 28, 30, 38
   - J. 28, 34, 39

8. ___
9. Snow Dog Ice Cream Shop opened during the hottest July on record. The shop sold 13 cones during the first hour. The second hour it sold 16 cones, and during the third hour, it sold 19 cones. If this pattern continues, how many cones will it sell during the sixth hour of business?

A. 22  B. 25  C. 28  D. 31  9. _____

10. Eduardo raised $16 shoveling snow. How much more money must he earn in order to buy a $38 ticket to a local concert?

F. $16  G. $12  H. $22  J. $20  10. _____

11. Complete the equation to make a balanced equation.

\[ 14 + 18 = 8 + 6 + \Box \]

A. 9  B. 17  C. 18  D. 20  11. _____

12. Gracie uses 2 quarters, 3 dimes, and 1 nickel to pay for a taco. Antonia has 1 quarter, 4 dimes, and several nickels. How many nickels will Antonia need to pay for her taco?

F. 1  G. 2  H. 3  J. 4  12. _____

13. Solve for \( b \).

\[ 17 - b = 9 \]

A. 9  B. 8  C. 7  D. 6  13. _____

14. Find the value of \( 27 - (m + 5) \) if \( m = 9 \).

F. 13  G. 18  H. 22  J. 12  14. _____

15. Find the value of \( (k + 8) - 2 \) if \( k = 13 \).

A. 11  B. 6  C. 19  D. 18  15. _____

16. A number plus 16 equals 22. What is the number?

F. 6  G. 7  H. 8  J. 9  16. _____

17. Jasmine has 28 stickers in her collection. She gave away 13 butterfly stickers and bought 9 flower stickers. How many stickers does she have now?

A. 28  B. 15  C. 22  D. 24  17. _____
Chapter Test, Form 2A

Read each question carefully. Write your answer on the line provided.

1. What is the value of $23 + g$, if $g = 5$?
   A. 29   B. 25   C. 18   D. 28

2. What number makes the sentence true?
   $12 + q = 18$
   F. 4   G. 5   H. 6   J. 7

3. What is the value of this expression if $r = 6$?
   $\ (r - 2) + 9$
   A. 7   B. 11   C. 13   D. 17

4. Kayla earned $14$ more than Courtney over the weekend.
   If Courtney earned $27$, how much did Kayla earn?
   F. $41$   G. $31$   H. $51$   J. $45$

5. A number plus $18$ equals $39$. What is the number?
   A. 18   B. 21   C. 19   D. 22

6. $12$ subtracted from a number equals $5$. What is the number?
   F. 8   G. 15   H. 17   J. 18

7. Ryan picked up $28$ soda cans during the first hour of the local park clean-up. By the end of the second hour he had picked up $53$ cans total. How many cans did Ryan pick up during the second hour?
   A. 18 cans   B. 25 cans   C. 24 cans   D. 20 cans

8. Pete has a part-time job taking tickets for the roller coaster at the amusement park. On Friday, he made $15$. How much more must he earn to buy a $37$ ticket to Sunday’s football game?
   F. $22$   G. $12$   H. $37$   J. $25$

9. The new concession stand at Providence Ice Rink opened in October. They sold $112$ cups of hot chocolate during October. They sold $139$ cups in November and during December, they sold $166$ cups. If this pattern continues, how many cups will they sell in March?
   A. 210   B. 220   C. 193   D. 247
10. Determine the next three numbers in the pattern.

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
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<tr>
<td>25</td>
<td>21</td>
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<tr>
<td>32</td>
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<tr>
<td>34</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>

F. 30, 39, 48  
G. 28, 30, 32  
H. 28, 30, 43  
J. 36, 38, 51

11. Complete the equation to make a balanced equation.

\[41 + 15 = 20 + 21 + \square\]

A. 41  B. 17  C. 15  D. 12

12. Jamie uses 3 quarters, 2 dimes, and 4 nickels to pay for a coffee. Joanna has 2 quarters, 7 nickels, and several dimes in her pocket. How many dimes will Joanna need to add from her pocket to pay for her coffee?

F. 2  G. 3  H. 4  J. 5

13. Solve for \( b \).

\[21 - b = 8\]

A. 13  B. 14  C. 15  D. 16

14. Find the value of \( 55 - (p + 19) \) if \( p = 14 \).

F. 36  G. 74  H. 33  J. 22

15. Find the value of \( (g + 3) - 7 \) if \( g = 13 \)

A. 4  B. 6  C. 9  D. 10

16. A number plus 17 equals 25. What is the number?

F. 7  G. 8  H. 9  J. 10
Read each question carefully. Write your answer on the line provided.

1. If \( r = 3 \), what does \( 15 + r \) equal?
   - A. 12
   - B. 18
   - C. 45
   1. ____

2. If \( 32 + t = 56 \), what does \( t \) equal?
   - F. 24
   - G. 16
   - H. 14
   2. ____

3. If \( b = 6 \), what does \( (b - 2) + 10 \) equal?
   - A. 12
   - B. 14
   - C. 16
   3. ____

4. While working in the library, David shelved 16 more books than Ben. If David shelved 63 books, how many books did Ben shelve?
   - F. 79
   - G. 74
   - H. 47
   4. ____

5. A number plus 4 equals 18. What is the number?
   - A. 12
   - B. 13
   - C. 14
   5. ____

6. 3 subtracted from a number equals 12. What is the number?
   - F. 15
   - G. 13
   - H. 9
   6. ____

7. Martin grilled 14 hamburgers during his first hour of work. By the end of his second hour, he had grilled 41 hamburgers. How many hamburgers did Martin grill during the second hour?
   - A. 27
   - B. 35
   - C. 37
   7. ____

8. What three numbers come next in the pattern?

<table>
<thead>
<tr>
<th>Input (( l ))</th>
<th>Output (( m ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
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<tr>
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<tr>
<td>23</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

   - F. 23, 27, 31
   - G. 21, 27, 38
   - H. 21, 23, 25
   8. ____
9. A music store had a sale. On the first day of the sale, the store sold 23 CDs. On the second day, it sold 30 CDs, and on the third day, it sold 37 CDs. If this pattern continues, how many CDs will the store sell on the fifth day of the sale?
   A. 44    B. 51    C. 58

10. Shauna earned $12 from babysitting. How much more money does she need to earn to buy a $29 sweater she saw at the mall?
    F. $11    G. $13    H. $17

11. Choose the correct number so that the amount on either side of the equals sign is equal.
    \[12 + \_ = 9 + 3 + 8\]
    A. 8    B. 9    C. 10

12. Luis uses 4 quarters, 1 dime, and 7 pennies to purchase three postage stamps. Maria has 3 quarters, two dimes, several nickels, and two pennies in her pocket. How many nickels will Maria need to add from her pocket to pay for the same amount of stamps?
    F. 4    G. 5    H. 6

13. If \(25 - w = 15\), what does \(w\) equal?
    A. 9    B. 10    C. 11

14. If \(t = 4\), what is \(32 - (9 + t)\)
    F. 23    G. 19    H. 28

15. If \(d = 11\), what is \((d + 4) - 7\)
    A. 8    B. 15    C. 4

16. A number plus 15 equals 23. What is the number?
    F. 6    G. 7    H. 8

17. Allie had 13 pairs of earrings. She gave 4 pairs of gold earrings to her sister, and she bought two pairs of silver earrings. How many pairs of earrings does Allie have now?
    A. 10    B. 11    C. 12
Read each question carefully. Write your answer on the line provided.

1. What is the value of $17 + j$, if $j = 6$?  
2. What number makes the sentence true?  
   \[55 + c = 73\]  
3. What is the value of this expression if $p = 9$?  
   \[(p - 7) + 6\]  
4. Juan scored 14 points higher than Claudio on his biology test. If Juan’s score is 87, what is Claudio’s score?  
5. A number plus 5 equals 19. What is the number?  
6. Seven subtracted from a number equals 24. What is the number?  
7. Ms. Pappas graded 12 papers during her first hour of work. By the end of the second hour, she had graded 25 papers. How many papers did she grade during the second hour?  
8. Determine the next three numbers in the pattern.  

<table>
<thead>
<tr>
<th>Input ($y$)</th>
<th>Output ($z$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
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</tr>
<tr>
<td>26</td>
<td>31</td>
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<td></td>
</tr>
<tr>
<td>39</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td></td>
</tr>
</tbody>
</table>

9. The Bagel Place sold 113 bagels during its first week of business. During the second week it sold 131 bagels, and it sold 149 bagels in the third week. If this pattern continues, how many bagels will it sell during its sixth week of business?  
10. Becky earned $8 for weeding the garden. How much more money must she earn in order to buy a $15 pair of silver earrings?
3

Chapter Test, Form 2C  (continued)

11. Complete the equation to make a balanced equation.
   \[ 18 + 21 = \square + 9 + 21 \]

12. Aaron uses 2 quarters, 2 dimes, 1 nickel, and 4 pennies to pay for a candy bar. Mike has 1 quarter, 4 dimes, several nickels, and 4 pennies in his pocket. How many nickels will Mike need to pay for his candy bar?

13. Solve for \( w \).
   \[ 13 - w = 6 \]

14. Find the value of \( 16 - (f + 3) \) if \( f = 2 \)

15. Find the value of \( (h + 7) - 4 \) if \( h = 16 \)

16. A number plus 7 equals 19. What is the number?

17. Tim had 31 model cars in his collection. He sold 4 new models and bought 7 antique models. How many model cars does Tim have now?

18. Max collected 15 more cans for recycling than Rich. If Max collected 47 cans, how many did Rich collect?

19. Seventy-three people showed up for the Friday premiere of a new movie. Eighty-nine people attended the movie Saturday night, and 105 people attended the Sunday showing. If this pattern continues, how many people will attend the Tuesday night showing of the movie?

20. Gabriel read a newspaper article on Wednesday afternoon. He read another article on Thursday afternoon. The article on Wednesday was 534 words long. The one on Thursday was 212 words longer. How many words was the article that Gabriel read on Thursday?
Chapter Test, Form 2D

Read each question carefully. Write your answer on the line provided.

1. If \( a = 6 \), what is \( 18 + a \)?

2. If \( 14 + b = 22 \), what is \( b \)?

3. If \( c = 9 \), what is \( (c - 2) + 6 \)?

4. Kevin scored 14 points higher than Nick on his math test. If Kevin’s score is 92, what is Nick’s score?

5. A number plus 8 equals 19. What is the number?

6. Seven subtracted from a number equals 15. What is the number?

7. Maggie handed out 26 flyers during her first hour of work. By the end of the second hour, she had handed out 54 flyers. How many flyers did she hand out during the second hour?

8. What three numbers come next in the pattern?

<table>
<thead>
<tr>
<th>Input ((j))</th>
<th>Output ((k))</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

9. Lee’s Market sold 56 pounds of apples in August. It sold 74 pounds of apples in September and 92 pounds in October. If this pattern of sales continues, how many pounds of apples will the market sell in January?

10. Jack earned $15 washing cars in the neighborhood. How much more money must he earn to buy a $29 pair of jeans?
Chapter Test, Form 2D  (continued)

11. Choose the correct number so that the amount on either side of the equal sign is the same.
   \[ 17 + \Box = 17 + 12 + 13 \]

12. Yvette uses 3 quarters, two dimes, and two nickels to buy a rose for her mother. Carmen has 1 quarter, six dimes, and several nickels in her pocket. How many nickels will Carmen need to pay for a rose?

13. What is \( f \), if \( 17 - f = 14 \)?

14. If \( g = 6 \), what is \( 37 - (g + 4) \)?

15. If \( h = 12 \), what is \( (h + 3) - 5 \)?

16. A number plus 14 equals 23. What is the number?

17. Rita has 26 CDs in her collection. She gave away 4 rap CDs and bought 8 rock CDs. How many CDs does she have now?

18. Austin picked up 14 more pieces of trash than Eric. If Austin picked up 32 pieces of trash, how many pieces did Eric pick up?

19. On her first night as a waitress at The Pinewood Inn, Carlotta made $14 in tips. She made $25 in tips her second night, and $36 on her third night. If this pattern continues, what will she make on her fifth night?

20. Mason read a comic book on Monday, and he read another one on Tuesday. Monday’s comic book was 43 pages. Tuesday’s comic book was 29 pages longer. How long was the comic book Mason read on Tuesday?
Chapter Test, Form 3

Read each question carefully. Write your answer on the line provided.

1. Determine the value of $23 + z$, if $z = 14$.  
1. ________

2. What number makes the sentence true?  

$$7 + y = 21$$  

2. ________

3. Determine the value of the expression if $x = 13$.  

$$(x - 9) + 16$$  

3. ________

4. Amelia scored 16 points higher than Joe on her chemistry exam. If Amelia’s score was 95, determine Joe’s score.  

4. ________

5. A number plus 6 equals 35. Determine the number.  

5. ________

6. 13 subtracted from a number equals 8. Determine the number.  

6. ________

7. Fiona created 17 information packets during her first hour of work. By the second hour of work, she had created 42 packets. Determine how many packets Fiona created during the second hour.  

7. ________

8. Determine the next three numbers in the pattern.  

<table>
<thead>
<tr>
<th>Input ($I$)</th>
<th>Output ($O$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>23</td>
</tr>
<tr>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

8. ________

9. A coffee shop opened in September and sold 139 cups of coffee during its first week of business. It sold 158 cups during its second week and 177 cups in its third week. If this pattern continues, determine how many cups of coffee the shop will sell during its seventh week of business.  

9. ________
10. Andy earned $12 walking a neighbor’s dogs. Determine how much more money he must earn to buy a $21 ticket to a baseball game.

11. Complete the equation so that it is balanced.
   \[ 45 + 16 = 15 + 30 + \square \]

12. Amos uses 4 quarters, 2 dimes, and 2 nickels to buy an ice cream cone. Ray has 3 quarters, 2 dimes, and a bunch of nickels in his pocket. Determine how many nickels Ray needs to add from his pocket to pay for his ice cream.

13. Solve for \( k \).
   \[ 27 - k = 14 \]

14. Determine the value of \( 23 - (s + 8) \) if \( s = 13 \).

15. Determine the value of \( (t + 14) - 5 \) if \( t = 19 \).

16. A number plus 13 equals 32. Determine the number.

17. Shawn had 31 movie posters in his collection. He gave away 6 action film posters and bought 3 horror film posters. Determine how many posters Shawn now has in his collection.

18. At the beach, Cathy collected 14 more seashells than Louisa. If Cathy collected 25 shells, determine how many shells Louisa collected.

19. Krista earned $12 in tips during her first shift as a waitress at the Greenwood Diner. She earned $21 in tips during her second shift, and $30 during her third shift. If this pattern continues, determine what Krista will make on her sixth shift.

20. Ayla read a biography on Saturday and another biography on Sunday. Saturday’s biography was 164 pages long, and Sunday’s biography was 27 pages longer. Determine the page length of Sunday’s biography.
Chapter Extended-Response Test

Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem. Record your answer on another piece of paper.

1. a. What is the difference between an expression and an equation?

   b. It takes Jesse $x$ minutes to wash the dinner dishes. It takes him five minutes longer to dry and put away the dishes. If it takes him 15 minutes to dry and put away the dishes, how long does it take him to wash the dishes? Write an equation to represent this situation.

   c. Solve your equation.

2. Use the following problem to answer the questions.
Anna is making brownies to sell for 50¢ each. This week, she sold 22 brownies. Last week, she sold 12 brownies. How many more brownies did Anna sell this week than last week?

   a. Explain why you do not need to know the cost of the brownies to solve this problem.

   b. Suppose the problem did not include how many brownies were sold last week. Would you have been able to solve the problem? Explain why or why not.

   c. Suppose you need to find the difference in the amounts of money Anna made between the two weeks. Is there enough information to solve the problem? Explain your answer.

3. a. What is a balanced equation?

   b. Write an example of an equation that is not balanced. Explain.
Use this recording sheet with pages 122–123 of the Student Edition.
Read each question. Then fill in the correct answer.

1. A B C D

2. F G H J

3. A B C D

4. F G H J

5. A B C D

6. F G H J

7. A B C D

8. F G H J

9. A B C D

10. F G H J
Test Example

What is the value of the expression below if \( n = 8 \)?
\[ 22 + (n - 4) \]

A. 18  
B. 26  
C. 15  
D. 22

Read the Question

You need to find the value of \( n \) in the sentence.

Solve the Question

Replace the value of \( n \) in \( 22 + (n - 4) \).
\[ 22 + (8 - 4) \]
First, find the value of \( (8 - 4) \).
\[ 8 - 4 = 4 \]
Then, find \( 22 + 4 \).
\[ 22 + 4 = 26 \]
The value of \( 22 + (n - 4) \) when \( n = 8 \) is 26.
So, the answer is B.

Choose the best answer.

1. Ernesto has baked 38 cupcakes. Let \( c \) represent the total number of cupcakes needed for the bake sale. Which expression shows how many cupcakes are left to bake?
   - A. \( c + 38 \)
   - B. \( c + (38 - c) \)
   - C. \( 38 - c \)
   - D. \( c - 38 \)
   1. _____

2. What is the value of the expression below if \( n = 3 \)?
   \[ 13 - (9 + n) \]
   - F. 13  
   - G. 1  
   - H. 9  
   - J. 10  
   2. _____
Name ___________________________ Date __________________

Cumulative Standardized Test
Practice  (continued)

3. Which equation describes the rule in the pattern below?

<table>
<thead>
<tr>
<th>Input (n)</th>
<th>Output (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

A. \( n + 4 = p \)
B. \( n - 4 = p \)
C. \( n + 3 = p \)
D. \( n - 3 = p \)

3. ___

4. What is the value of \( z \) in the equation below?

\( 67 - z = 52 \)

F. 14  G. 15  H. 21  J. 12

4. ___

5. Antonio gave away 7 marbles. He now has 21 marbles in his collection. Which equation shows how many marbles he originally had?

A. \( 21 - 7 = m \)
B. \( m + 7 = 21 \)
C. \( m - 7 = 21 \)
D. \( 21 - m = 7 \)

5. ___

6. What number makes this number sentence true?

\( (7 + 5) + 3 = 7 + (\square + 3) \)

F. 5  G. 7  H. 12  J. 8

6. ___

7. Which rule describes the pattern below?

<table>
<thead>
<tr>
<th>Input (x)</th>
<th>Output (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

A. Add 8
B. Add 7
C. Add 4
D. Add 2

7. ___
8. Juan ordered a chicken sandwich for $3.49, french fries for $1.09, a salad for $2.50, and an iced tea for $.99. How much did Juan spend on his meal?
   F. $5.08   G. $9.18   H. $8.07   J. $7.07 8. ________

9. What is the value of the digit 7 in the number 9,725,842?
   A. 7,000,000   B. 700,000   C. 70,000   D. 7,000 9. ________

10. Which number is 1,000 more that 42,326?
    F. 42,336   G. 52,326   H. 43,326   J. 42,426 10. ________

11. Christina had 8 pairs of shoes in her closet. She donated to charity the 3 pairs she outgrew, and her grandmother bought her a new pair of shoes. How many pairs of shoes does Christina have now?
    A. 12   B. 9   C. 6   D. 1 11. ________

12. Daniel collected 17 more bottles for recycling than Kyle. If Daniel collected 44 bottles, how many did Kyle collect?
    F. 61   G. 17   H. 27   J. 25 12. ________

13. What is the value of the expression 3 + (n + 1) if n = 0? 13. ________


15. Complete the equation 18 + 15 = 18 + 7 + □ to make it balanced. 15. ________

16. Solve the equation 15 − n = 9 mentally. 16. ________

17. A number minus 6 equals 18. Write and solve an equation to find the number. 17. ________

18. Maura sold 11 more raffle tickets than Ashley. If Maura sold 19 tickets, how many tickets did Ashley sell? 18. ________

19. Alex made $12 in tips on his first night as a busboy at Pizza-Wow. He made $15 in tips on his second night and $18 in tips on his third night. If the pattern continues, how much will he make on his sixth night as a busboy? 19. ________
### Graphic Organizer

Use this graphic organizer to take notes on **Chapter 3: Algebra: Use Addition and Subtraction**.

Fill in the missing information.

<table>
<thead>
<tr>
<th>Algebra Term</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expression</strong></td>
<td>a combination of numbers, variables, and operation symbols that represents a mathematical quantity</td>
<td>$3(x) = 27$</td>
</tr>
<tr>
<td><strong>Variable</strong></td>
<td>a letter or symbol used to represent an unknown quantity</td>
<td>$3(x) = 27$, $x$ is the variable</td>
</tr>
<tr>
<td><strong>Parentheses</strong></td>
<td>tell you which operation to perform first</td>
<td>$12 - (7 + 2)$</td>
</tr>
<tr>
<td><strong>Equation</strong></td>
<td>a mathematical sentence that contains an equals sign, $=$, indicating that the left side of the equals sign has the same value as the right side</td>
<td>$4 + 5 = 9$</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td>when two sides of an equation remain equal, the equation remains balanced</td>
<td>$5 + 1 + 5 = 6 + 2 + 3$</td>
</tr>
</tbody>
</table>

### Anticipation Guide

**Algebra: Use Addition and Subtraction**

**STEP 1**

**Before you begin Chapter 3**

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

<table>
<thead>
<tr>
<th>Statement</th>
<th>STEP 2 A or D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sometimes, it is necessary to use a variable when writing an expression.</td>
<td>A</td>
</tr>
<tr>
<td>2. A variable is a letter or symbol that represents a known value.</td>
<td>D</td>
</tr>
<tr>
<td>3. An expression can contain numbers and symbols.</td>
<td>A</td>
</tr>
<tr>
<td>4. If an expression contains parentheses, you should perform the operation inside the parentheses first.</td>
<td>A</td>
</tr>
<tr>
<td>5. An equation will always contain an equals sign (=).</td>
<td>A</td>
</tr>
<tr>
<td>6. In the equation $4 + x = 6$, the value of the variable $x$ is 3.</td>
<td>D</td>
</tr>
<tr>
<td>7. There will never be extra information in a problem.</td>
<td>D</td>
</tr>
<tr>
<td>8. An equation is balanced when the amount on the left side of the equation is equal to the amount on the right side of the equation.</td>
<td>A</td>
</tr>
<tr>
<td>9. 2 dimes + 10 pennies = 7 nickels</td>
<td>D</td>
</tr>
<tr>
<td>10. If $x = 2$, $3 + x = 5$.</td>
<td>A</td>
</tr>
</tbody>
</table>

**STEP 2**

**After you complete Chapter 3**

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Reteach
Addition and Subtraction Expressions

A variable is a letter or symbol that represents an unknown number. In the expression $5 + x$, the unknown number is represented by the variable $x$.

You can find the value of an expression by substituting different numbers for the variable.

Find the value of $5 + x$ when $x = 2$.

$5 + x$ when $x = 2$

$5 + 2 = 7$

So, the value of $5 + x$ when $x = 2$ is 7.

Find the value of $m - 3$ when $m = 7$.

$m - 3$ when $m = 7$

$7 - 3 = 4$

So, the value of $m - 3$ when $m = 7$ is 4.

Find the value of each expression if $m = 7$ and $z = 2$.

1. $m + 7$ 8  
2. $5 + 7$ 12  
3. $5 + s$ 8  
4. $3 + m$ 10  
5. $7 - m$ 0  
6. $19 - s$ 16

Find the value of each expression if $b = 9$ and $e = 4$.

7. $b + 3$ 12  
8. $b + 8$ 17  
9. $e + 4$ 8  
10. $e + 6$ 10  
11. $b - e$ 5  
12. $(e + 2) - 3$ 3

Skills Practice
Addition and Subtraction Expressions

Find the value of each expression if $y = 6$ and $z = 2$.

1. $9 - y$ 3  
2. $7 - z$ 5  
3. $z + 3$ 5  
4. $y + 7$ 13  
5. $3 + y$ 9  
6. $y - 1$ 5  
7. $(12 - y) + 4$ 10  
8. $18 - (8 + z)$ 8  
9. $z + 17$ 19  
10. $12 + y$ 18  
11. $(5 + y) - 3$ 8  
12. $(5 - z) + 9$ 12

Write an expression for each situation.

13. 7 more than $x$ $x + 7$  
14. 12 and $y$ more $12 + y$  
15. 5 and $p$ more $5 + p$  
16. 25 and $b$ more $25 + b$  
17. 2 and $m$ more $2 + m$  
18. 15 more than $q$ $q + 15$  
19. 3 more than $g$ $g + 3$  
20. 41 and $f$ more $41 + f$

Solve.

21. George earns $30 plus tips each day. Write an expression to show his total daily pay. If George received $8 in tips yesterday, how much did he earn in all?

$30 + x; $38

22. Tanesha has 24 marbles. She gives away $x$ number of marbles. Write an expression for the number of marbles she has left.

$24 - x$
Find the value of each expression if \( y = 7 \) and \( b = 2 \).

1. \( y + 6 \) = 13
2. \( b + 8 \) = 10
3. \( y - 2 \) = 5

4. \( 14 - b \) = 12
5. \( y + 18 \) = 25
6. \( 12 + b \) = 14

7. \( (y - 1) + 3 \) = 9
8. \( 19 - (b + 3) \) = 14
9. \( y + (14 - 9) \) = 12

Write an expression for each situation.

10. four more than \( j \) = \( j + 4 \)
11. \( v \) minus fifteen = \( v - 15 \)
12. the sum of \( k \) and twelve = \( k + 12 \)
13. twenty-three subtracted from \( x \) = \( x - 23 \)

Write an expression for each situation. Then find the value of the expression to answer the question.

14. John walks 5 minutes longer to school than Rosa. If Rosa walks 24 minutes to school, how long does John walk to school?

\( 5 + r; \) 29 minutes

15. Caroline is 7 inches shorter than Kevin. Kevin is 56 inches tall. How tall is Caroline?

\( k - 7; \) 49 inches

Solve.

1. Ming and Amy count the total number of beads they have. Ming has 21 beads. Write an expression to show the total number of beads that Ming and Amy have all together.

\( 21 + n \)

2. Julie has 16 paper clips. She gives away \( x \) number of paper clips. Write an expression for the number of paper clips she has left.

\( 16 - x \)

3. Each week, Hector sends 2 E-mails to his friend Chet. He also sends E-mails to other friends each week. Write an expression to show how many E-mails Hector sends each week.

\( 2 + n \)

4. George and his brother have a total of 8 CDs. If George has \( n \) CDs, write an expression to show how many CDs his brother has.

\( 8 - n \)

5. Delia saves $2 from her weekly allowance. She also saves the money she earns from delivering newspapers each week. Write an expression to show her total weekly savings. If she earns $5 delivering newspapers this week, how much money does she save in all this week?

\( $2 + n; $7 \)
The stories below use words to express ideas about addition and subtraction. Most of them match an algebraic expression at the right. One algebraic expression does not match. Write the letter of an algebraic expression to match each story. Rewrite the incorrect algebraic expression to make it match.

1. Sally has more dollars than Angie, who has ten dollars.
   - C, \(10 + x\) or \(x - 10\)
   - A. \(31 - x\)
   - B. \(12 + 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

2. Last month Brett read fewer books than his friend Bill, who read seven biographies.
   - G
   - A. \(7 - n\)
   - B. \(12 - 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

3. Kim baked a dozen apple pies. Duane baked an equal number of apple pies, plus some cherry pies.
   - B
   - A. \(10 - n\)
   - B. \(12 + 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

4. There are 24 hours in a day, but everyone spends some number of them sleeping.
   - F
   - A. \(24 - n\)
   - B. \(12 - 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

5. Tom started out with seventy-six trading cards, but he ended up with only fifty-four.
   - H
   - A. \(76 - x\)
   - B. \(12 - 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

6. There are 31 days in January, but Heather only works some of the days.
   - A
   - A. \(31 - n\)
   - B. \(12 + 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

7. Jennifer calls her Grandmother more than Raul, who calls his Grandmother once a week.
   - D
   - A. \(82 - x\)
   - B. \(12 + 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

8. Jacob had eighty-two rolls of wrapping paper to sell. After selling the paper, he had forty-seven rolls of paper left.
   - H
   - A. \(82 - x\)
   - B. \(12 + 12 + x\)
   - C. \(x + 20\)
   - D. \(1 + x\)
   - E. \(x - 2\)

You can use mental math to solve equations.

**Addition Equations**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 + n = 7)</td>
<td>(n = 4)</td>
</tr>
<tr>
<td>(7 - n = 5)</td>
<td>(n = 2)</td>
</tr>
<tr>
<td>(2 + n = 10)</td>
<td>(n = 8)</td>
</tr>
<tr>
<td>(n - 4 = 6)</td>
<td>(n = 10)</td>
</tr>
<tr>
<td>(n + 4 = 6)</td>
<td>(n = 2)</td>
</tr>
<tr>
<td>(n - 8 = 1)</td>
<td>(n = 9)</td>
</tr>
<tr>
<td>(n + 6 = 10)</td>
<td>(n = 4)</td>
</tr>
<tr>
<td>(14 - n = 6)</td>
<td>(n = 8)</td>
</tr>
<tr>
<td>(6 + n = 13)</td>
<td>(n = 7)</td>
</tr>
<tr>
<td>(n - 2 = 13)</td>
<td>(n = 15)</td>
</tr>
</tbody>
</table>

**Subtraction Equations**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11 - n = 8)</td>
<td>(n = 3)</td>
</tr>
<tr>
<td>(17 - n = 11)</td>
<td>(n = 6)</td>
</tr>
<tr>
<td>(8 + n = 14)</td>
<td>(n = 6)</td>
</tr>
<tr>
<td>(15 - n = 4)</td>
<td>(n = 11)</td>
</tr>
<tr>
<td>(11 + n = 18)</td>
<td>(n = 7)</td>
</tr>
<tr>
<td>(19 - n = 13)</td>
<td>(n = 6)</td>
</tr>
<tr>
<td>(17 + n = 20)</td>
<td>(n = 3)</td>
</tr>
<tr>
<td>(8 + n = 14)</td>
<td>(n = 6)</td>
</tr>
<tr>
<td>(9 + n = 16)</td>
<td>(n = 7)</td>
</tr>
<tr>
<td>(20 - n = 13)</td>
<td>(n = 7)</td>
</tr>
</tbody>
</table>
Skills Practice
Solve Equations Mentally

Solve each equation mentally.
1. \( n + 6 = 12 \) \( n = 6 \)
2. \( n - 6 = 3 \) \( n = 9 \)
3. \( 4 + n = 7 \) \( n = 3 \)
4. \( n - 5 = 10 \) \( n = 15 \)
5. \( n + 6 = 15 \) \( n = 9 \)
6. \( 12 - n = 1 \) \( n = 11 \)
7. \( n + 9 = 13 \) \( n = 4 \)
8. \( 18 - n = 9 \) \( n = 9 \)
9. \( 10 + n = 18 \) \( n = 8 \)
10. \( n - 4 = 12 \) \( n = 16 \)
11. \( 7 + n = 20 \) \( n = 13 \)
12. \( 20 - n = 13 \) \( n = 7 \)
13. \( 5 + n = 16 \) \( n = 11 \)
14. \( n - 8 = 4 \) \( n = 12 \)
15. \( n + 11 = 23 \) \( n = 12 \)
16. \( n - 12 = 13 \) \( n = 25 \)

Write and solve an equation for each situation.
17. A number plus 5 equals 18.
\( n + 5 = 18; n = 13 \)
18. The sum of 6 and a number is 21.
\( 6 + n = 21; n = 15 \)
19. Nine less than a number equals 7.
\( n - 9 = 7; n = 16 \)
\( 25 - n = 14; n = 11 \)

Solve.
21. Melinda has $12 in her pocket. She bought a card at the store and now has $8. Write and solve an equation to find how much the card cost.
\$12 - c = $8; c = $4

Homework Practice
Solve Equations Mentally

Solve each equation mentally.
1. \( 3 + d = 11 \) \( d = 8 \)
2. \( f + 4 = 10 \) \( f = 6 \)
3. \( 15 - h = 4 \) \( h = 11 \)
4. \( j - 2 = 19 \) \( j = 21 \)
5. \( 6 + m = 17 \) \( m = 11 \)
6. \( 15 - r = 2 \) \( r = 13 \)
7. \( 20 = t + 7 \) \( t = 13 \)
8. \( 9 = w - 12 \) \( w = 21 \)
9. \( 12 = 3 + z \) \( z = 9 \)
10. \( 17 - b = 4 \) \( b = 13 \)

Write and solve an equation for each situation.
11. A number plus 5 equals 13. What is the number?
\( n + 5 = 13; n = 8 \)
12. Twelve less than a number equals 25. What is the number?
\( n - 12 = 25; n = 37 \)
13. The sum of 4 and a number is 27. What is the number?
\( 4 + n = 27; n = 23 \)
14. Seven subtracted from a number is 15. What is the number?
\( n - 7 = 15; n = 22 \)

Spiral Review
Find the value of each expression if \( x = 6 \) and \( c = 4 \). (Lesson 3-1)
15. \( x + 3 \) \( 9 \)
16. \( c + 12 \) \( 16 \)
17. \( x - 5 \) \( 1 \)
18. \( 10 + c \) \( 14 \)
19. \( (x - 2) + 7 \) \( 11 \)
20. \( 22 - (c + 3) \) \( 15 \)

Write an expression for each situation.
21. seven more than \( d \) \( d + 7 \)
22. \( w \) minus 12 \( w - 12 \)
23. the sum of \( f \) and seventeen \( f + 17 \)
24. twenty-one subtracted from \( p \) \( p - 21 \)
Problem-Solving Practice

Solve Equations Mentally

Write and solve an equation for each situation.

1. Tad had $10. He spent some of his money on a model car. If Tad has $4 left, how much money did the model car cost?
   \[10 - n = 4; \quad 6\]

2. A large puzzle costs $12. A small puzzle and a large puzzle together cost $18. How much would you pay for 1 small puzzle?
   \[12 + n = 18; \quad 6\]

3. Nadine bought some new CDs. She has 15 other CDs. She now has 20 CDs. How many CDs did she buy?
   \[n + 15 = 20; \quad 5\, \text{CDs}\]

4. Emma collected 18 rocks. She gave some to her sister. Emma has 12 rocks left. How many rocks did she give her sister?
   \[18 - n = 12; \quad 6\, \text{rocks}\]

5. Tony rented some movies. He watched 2 movies over the weekend. He has 6 movies left. How many movies did Tony rent?
   \[n - 2 = 6; \quad 8\, \text{movies}\]

6. Kameko scored 12 points in the first half of a basketball game. At the end of the game, he had a total of 25 points. How many points did Kameko score in the second half of the game?
   \[12 + n = 25; \quad 13\, \text{points}\]

7. Laura planted 20 flowers in her garden. A rabbit ate some of the flowers. Laura has 11 flowers left. How many flowers did the rabbit eat?
   \[20 - n = 11; \quad 9\, \text{flowers}\]

Enrich

Half a Dozen Plus One

Add and subtract mentally to solve these rhyming riddles. Write only the answer on each line.

1. Take the number of hours in a day
   Plus a dozen words to say
   \[36\]

2. Start with the number of months in one year
   Add the legs found on one deer
   \[16\]

3. Four plus seven
   Now add eleven
   \[22\]

4. Take the number of fingers on one hand
   Plus all the states in this great land
   \[55\]

5. Count the toes on two feet
   Add the t’s found in retreat
   \[12\]

6. Start with the number of days in a week
   Minus the number of letters in the word seek
   \[3\]

Now write a rhyming riddle of your own and trade with a partner to check your answers. Think about rhyming words like flag and bag, door and more, eight and skate.

Sample answer: Count the stars on the American flag Add six marbles in a bag (56)
A problem is **missing information** when you cannot solve it unless you have more information. A problem has **extra information** when it gives more information than needed to solve it.

### Missing Information

**Problem:** Jack spent 45 minutes on his homework. Jenny started her homework at 4:00 P.M. Who spent more time doing their homework, Jack or Jenny? You cannot solve the problem unless you know when Jenny finished her homework.

### Extra Information

**Problem:** Sue spent 30 minutes raking leaves after school. She spent 20 minutes raking leaves after dinner. She then practiced her violin for 30 minutes. How long did Sue take to rake the leaves? To solve the problem, you do not need to know how long it took Sue to practice.

Choose the correct answer.

The music store is having a sale on CDs. The store also sells videos. The cost is $15 for 5 CDs. How many CDs can Tyler buy?

1. Which of the following statements is false?
   - A. There are more than 20 CDs on clearance.
   - B. It costs $15 for 5 videos.
   - C. It costs $30 for 10 CDs.
   - D. One CD on sale costs $3.

2. What information is missing?
   - F. the cost of each CD
   - G. what the store sells
   - H. how much money Tyler has
   - J. what Tyler wants to buy

Circle the question in each problem. Underline the needed facts. Identify the missing or extra information. Then solve if possible.

3. What information is not needed?
   - A. the number of students
   - B. the number of chaperones
   - C. the number of students that can fit in each van
   - D. none of the above

4. How many vans are needed?
   - F. 5 vans
   - G. 4 vans
   - H. 3 vans
   - J. 2 vans

5. Sally eats three turkey sandwiches and two ham sandwiches a week. She eats at 12:30 every day. How many turkey sandwiches does she eat in two weeks?

Extra information: She eats at 12:30 everyday and she eats two hamsandwiches; 6

6. Jill is 9 years old and she downloads 10 songs a month. How much does she spend after 3 months?

Extra information: Jill is 9 years old; Missing information: How much a download costs.

7. There is a total of 30 students. Twelve of them want chocolate ice cream. How many of them prefer strawberry?

Missing information: How many other flavors there are.
Skills Practice

Problem-Solving Skill

Identify any extra or missing information. Then solve if possible.

1. A round-trip first-class ticket from St. Louis to San Diego costs $1,600. A round-trip coach ticket costs $359. The Howards buy 3 tickets. How much do they spend?
   missing information: You need to know what kind of tickets the Howards bought.

2. Marsha and Vicki are selling lemonade. Each pitcher of lemonade can fill 10 cups. Each cup is 25 cents. If they sell 30 cups, how many pitchers of lemonade must they make?
   extra information: Each cup is 25 cents.; 3 pitchers

3. The Smith family is going to the zoo on Saturday. Admission for adults is $12. Admission for children is $5 less. How much will admission to the zoo cost the Smith family?
   missing information: how many adults and children are in the Smith family

4. Sam runs 2 miles every day after school. He runs 5 miles on Saturday and does not run on Sunday. He also has basketball practice on Saturday. How many miles does Sam run over 2 weeks?
   extra information: Sam has basketball practice on Saturday.; 30 miles

Solve. Use any strategy.

5. Denzel has 3 rows of shelves in his bedroom. Books, games, or CDs occupy each shelf. The middle shelf holds CDs. If the top shelf does not hold books, which shelf holds games?
   top shelf
   Use logical reasoning

6. Arlene spent $30 for a jacket. She now has $5 left. How much money did Arlene have before she bought the jacket?
   $35
   Write an equation

Identify any missing or extra Information. Then solve if possible.

1. At the kennel, the staff walks each dog 2 times per day. They walk 3 dogs at a time. How many dogs do they take for a walk each day?
   missing information: the number of dogs at the kennel.

2. Each week, Michelle will invite 1 girl from her class to come home with her. There are 17 boys in her class and 16 (including Michelle) girls. How many weeks will it take to invite every girl in her class?
   extra information: There are 17 boys in her class.; 15 weeks.

3. Patrick loves vegetables. Every day for school he packs a small bag of carrots, a small bag of celery, and a small bag of broccoli. He also likes apple juice. How many small bags of vegetables does Patrick bring to school in a week?
   extra information: He likes apple juice.; 15 bags of vegetables in a week.

4. Nicole wants to buy a turkey sandwich, chips, and a bottle of water for lunch. She has $5.00 with her. Does she have enough?
   missing information: The cost of the food she wants.

Solve each equation mentally. (Lesson 3-2)

5. $5 + d = 9$ $d = 4$

6. $f + 7 = 20$ $f = 13$

7. $16 - h = 5$ $h = 11$

8. $j - 7 = 12$ $j = 19$

9. $5 + m = 14$ $m = 9$

10. $22 - r = 7$ $r = 15$

11. $24 = t + 6$ $t = 18$

12. $12 = w - 11$ $w = 23$

13. $9 = 4 + z$ $z = 5$

14. $18 = 11 + t$ $t = 7$
Libby wants to paint her bedroom, which is 9 feet by 12 feet, three different shades. She wants the bottom half of the walls to be a dark blue color. She picked a bright shade of pink for a 6 inch wide band just above the dark blue. Libby wants the rest of each wall to be pale pink all the way to the ceiling. How much wider is the pale pink band than the bright pink 6 inch band?

1. What information is given that would help you answer the question?
   For example, “the bottom half” and “all the way to the ceiling.”

2. What information is needed but missing?
   The height of the walls.

3. Choose a likely number for the missing information and use it to estimate an answer.
   For example if the wall is 8 feet or 96 inches high, the dark blue band will be 48 inches wide. The bright pink band will add 6 inches. So the pale pink band will be 42 inches wide – 36 inches wider than the bright pink band.

4. Paint is sold in 1-gallon containers. One gallon of paint covers about 350 square feet of wall. Suppose the dark blue paint costs $17.95 per gallon, the bright pink paint costs $18.33 per gallon, and the pale pink paint costs $18.99 per gallon. Using your estimate from problem 3, calculate the cost of painting Libby’s bedroom.
   $55.27
Skills Practice
Algebra: Find a Rule

Write an equation that describes the pattern. Then use the equation to find the next two numbers in the pattern.

1. Rule: $a + 2 = b$
<table>
<thead>
<tr>
<th>Input (a)</th>
<th>Output (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>

2. Rule: $f - 5 = g$
<table>
<thead>
<tr>
<th>Input (f)</th>
<th>Output (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>26</td>
<td>21</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>34</td>
<td>29</td>
</tr>
<tr>
<td>38</td>
<td>33</td>
</tr>
</tbody>
</table>

3. Rule: $h + 7 = i$
<table>
<thead>
<tr>
<th>Input (h)</th>
<th>Output (i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>24</td>
<td>31</td>
</tr>
</tbody>
</table>

4. Rule: $t - 11 = u$
<table>
<thead>
<tr>
<th>Input (t)</th>
<th>Output (u)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>33</td>
<td>22</td>
</tr>
<tr>
<td>37</td>
<td>26</td>
</tr>
<tr>
<td>41</td>
<td>30</td>
</tr>
</tbody>
</table>

This table shows how much a drive-in movie theater charges.

5. The drive-in movie theater charges $7 per car plus $1 per person. Use the table to the left to write an equation for this situation.
   \[ p + 7 = t \]

6. Find the cost for bringing 4, 5, and 6 people to the movies.
   \$11, \$12, \$13

3–4 Skills Practice
Algebra: Find a Rule

Complete the input/output table for each equation.

1. sample answer
<table>
<thead>
<tr>
<th>Input (e)</th>
<th>Output (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

2. sample answer
<table>
<thead>
<tr>
<th>Input (g)</th>
<th>Output (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>26</td>
</tr>
</tbody>
</table>

3. A dance studio offers lessons to students. It costs $25 to rent the studio plus $1 per student. Use the table to write an equation for this situation.
   \[ s + 25 = f \]

4. Find how much it will cost if 6, 8, and 10 students take lessons.
   \$31, \$33, \$35

Spiral Review
Identify any missing or extra information. Then solve if possible. (Lesson 3-3)

5. Every day Pedro wears a different baseball cap to school. He has red hats, black hats, and blue hats. How many weeks will it take for him to wear all of his hats?
   missing information: the number of hats Pedro has
Problem-Solving Practice
Algebra: Find a Rule

The table shows how many people will be going on a field trip.

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

1. Jessica’s class is going on a field trip. The school will bring all the students who are there that day plus 4 chaperones. Use the table to write an equation for this situation. \( s + 4 = p \)

2. Find how many people will go if there are 31 and 33 students going. 35, 37

3. Write a new equation if the school will bring the students and 6 chaperones. \( s + 6 = p \)

4. Create a table for the new equation. How many people will go if 35 students go on the trip?

Sample answer

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td>33</td>
<td>39</td>
</tr>
<tr>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>37</td>
<td>43</td>
</tr>
<tr>
<td>39</td>
<td>45</td>
</tr>
</tbody>
</table>

41 people

Enrich
Five Functions

Continue each pattern. Then write the function that makes it work. Here is an example.

<table>
<thead>
<tr>
<th>Input (s)</th>
<th>Output (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 5, 10, 15,</td>
<td>20, 25, 30</td>
</tr>
</tbody>
</table>
| The function is \( x + 5 \)

1. 3, 9, 15, 21, 27, 33, 39
The function is \( \frac{27}{x + 6} \)

2. 72, 68, 64, 60, 56, 52, 48
The function is \( \frac{56}{x - 4} \)

The function is \( \frac{79}{x + 10} \)

4. 28, 35, 42, 49, 56, 63, 70
The function is \( \frac{56}{x + 7} \)

5. 81, 72, 63, 54, 45, 36, 27
The function is \( \frac{45}{x - 9} \)

6. 25, 33, 41, 49, 57, 65, 73
The function is \( \frac{57}{x + 8} \)

7. 93, 88, 83, 78, 73, 68, 63
The function is \( \frac{73}{x - 5} \)

8. 41, 45, 49, 53, 57, 61, 65
The function is \( \frac{57}{x + 4} \)
There are many ways to solve most math problems. You’ll decide which strategy works best for you when you read the problems. Here is a list of problem-solving strategies:

- **Draw a picture:** This strategy can help you look at the information in the problem a different way—useful when the problem is about distance or location.
- **Look for a pattern:** This strategy can help you solve problems when the input changes.
- **Make a table:** This strategy can help you solve problems that have a lot of information to organize.

**Use this problem to learn more about choosing a strategy.**

When Lilly was 7 years old, she earned an allowance of $0.75. When she was 8 years old, she earned $1.25, and when she was 9 years old, she earned $1.75. Now Lilly is 10 years old. If the pattern continues, how much allowance does Lilly earn?

**Understand**

You know that Lilly earned $0.75 when she was 7, $1.25 when she was 8, and $1.75 when she was 9. You need to find how much allowance Lilly earns as a 10-year-old.

**Plan**

Choose a strategy. The input (Lilly’s age) is changing. Looking for a pattern in the output (Lilly’s allowance) will help you find the answer. Look for a pattern to solve this problem.

<table>
<thead>
<tr>
<th>Age</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowance</td>
<td>$0.75</td>
<td>$1.25</td>
<td>$1.75</td>
<td>?</td>
</tr>
</tbody>
</table>

Look at the three numbers. How do you get from $0.75 to $1.25? How do you get from $1.25 to $1.75? Is there a rule that tells how to get from one number to the next?

Since the numbers are getting bigger, an amount is being added to each number. Use subtraction to find the amount being added.

$1.25 - $0.75 = $0.50
$1.75 - $1.25 = $0.50

Fifty cents was added to each number. Add $0.50 to $1.75 to find the answer.

$1.75 + $0.50 = $2.25
Lilly’s allowance is now $2.25.

**Check**

Look back at the problem. Check that the difference between $2.25 and $1.75 is $0.50.

$2.25 - $1.75 = $0.50
Your answer is correct.

Use any strategy on p. 28 to solve. Tell which strategy you used.

1. Each farmer brought 3 animals to the fair. If the fair has space in one barn for 24 animals, how many farmers can bring animals to that barn? **8 farmers**

   **Strategy:** sample answer: make a table

2. Mackenzie is buying breakfast at school. Pancakes are $1.75, milk is $0.85, and eggs are $2.25. Mackenzie orders all three items. If she pays with a $10.00 bill, how much change will she get back? **$5.15**

   **Strategy:** sample answer: draw a picture
Skills Practice
Problem-Solving Investigation

Use any strategy shown below to solve. Tell which strategy you used.

1. When the new apartment building opened, 12 families moved in. If each family averaged 2 children, about how many children live in the new building?
   - 24 children
   - Sample answer: make a table

2. Luis spent $12.50 on groceries for his family. He bought eggs, milk, bananas, and bread. If he paid with a $20-bill, how much change did he get back?
   - $7.50
   - Sample answer: draw a picture

3. Olivia is making bead bracelets. She places two blue beads, then a green bead and a yellow bead. How many blue beads will she need if she uses 47 beads in all?
   - 24 blue beads
   - Sample answer: find a pattern

4. Adam is helping his grandmother make a quilt. For every green square she uses, she needs 2 red squares, 3 yellow squares, and 4 white squares. If she uses 4 green squares, how many squares will she need in all?
   - 40 squares
   - Sample answer: make a table

5. Madeline wants to download songs that cost $2 each. If she has $15, how many songs can she download?
   - 7 songs
   - Sample answer: make a table

6. Erin picks up golf balls at the local golf course. Today she has collected 45 white balls, 17 yellow balls, 12 orange balls, and 5 pink balls. How many golf balls has Erin collected?
   - 79 golf balls
   - Sample answer: draw a picture

Homework Practice
Problem-Solving Investigation

Use any strategy shown below to solve. Tell which strategy you used.

1. Allison can read 4 pages of her book in 8 minutes. How many minutes will it take her to read 16 pages of her book?
   - 32 minutes
   - Sample answer: make a table

2. Richard can clean his room in 22 minutes. Corey can clean his room in 25 minutes, and Brooke can clean her room in 21 minutes. If they have to clean their rooms twice a week, how many minutes do all three spend cleaning their rooms each week?
   - 136 minutes
   - Sample answer: make a table

3. Complete the number pattern.
   - 45, 43, 42, 40, 39, 37, 36, 34, 33
   - Sample answer: look for a pattern

Spiral Review

Create an input/output table for each equation. (Lesson 3-4)

4. \( e + 5 = f \)
   - Sample answer
   - Rule: \( e + 5 = f \)
   - Input \( e \) | Output \( f \)
   - 5 | 10
   - 10 | 15
   - 15 | 20
   - 20 | 25
   - 25 | 30

5. \( g - 8 = h \)
   - Sample answer
   - Rule: \( g - 8 = h \)
   - Input \( g \) | Output \( h \)
   - 10 | 2
   - 12 | 4
   - 14 | 6
   - 16 | 8
   - 18 | 10
Enrich
Talent Show

Joe, Bob, and I went to the talent show. We counted performers that we know.
Joe, who is known to use his head, said, “All but two of them wore red.”
Bob, who is a clever fellow, said, “All but two of them wore yellow.”
And I, with 20-20 sight, could see that all but two wore white.

Use any strategy to answer the questions.

1. How many performers were counted? 3 performers

2. Explain your thinking.

   Wording may vary, but reasoning should reflect the understanding that if there are \( x \) performers, then:
   
   \[ (x - 2) + (x - 2) + (x - 2) = x. \]

3. Find as many ways as you can to show the number 90, using three numbers and at least two operations.

   Answers will vary. Possible answer:
   
   \[ 8 \times 10 + 10 \]

4. The product of two numbers is 2,400. One number is 20 more than the other. What are the two numbers? 60 and 40

Reteach
Balanced Equations

Equations are balanced when both sides are equal (=). They are not balanced when the two sides are not equal (≠).

Think about holding a pencil in one hand and something heavier, like your math book, in the other hand. You can tell that they are not the same weight.

\[ \text{pencil} \neq \text{math book} \]

If the two sides have the same totals, they are equal. They are equal even if the numbers on each side are different:

\[ 1 + 7 + 2 = 5 + 5 \]
\[ 10 = 10 \]

Sometimes you have to figure out what number to add or subtract from one side to make the two sides equal, or balanced.

\[ 1 + 7 + \_ = 5 + 5 \]
\[ 8 + \_ = 10 \]

You need to add 2 to the left side to equal 10.

\[ 1 + 7 + 2 = 5 + 5 \]

Complete each equation to make a balanced equation. sample answer given.

1. 5 nickels + 3 dimes = 2 quarters + 1 nickel
2. 2 dimes + 15 pennies = 3 nickels + 2 dimes
3. 5 dimes - 10 pennies = 5 nickels + 15 pennies
4. 4 dimes - 6 pennies - 3 nickels = 6 dimes - 8 nickels - 1 penny

Tell whether each pair of expressions will form a balanced equation.

5. 4 + 5
   6. 6 + 12
   7. 14 - 8
   
   yes  no  yes

6 + 3
9 + 8
2 + 4
Complete each equation to make a balanced equation.

1. \(14 + 5 = 14 + \_
\)
2. \(21 + 8 = 10 + 11 + \_
\)
3. \(36 + 9 = 15 + 21 + \_
\)
4. \(44 + 7 = 20 + 24 + \_
\)

Tell whether each pair of expressions will form a balanced equation.

5. \(12 + 8\quad yes\quad 12 + 4 + 4\quad no\)

6. \(5 + 17\quad yes\quad 3 + 9 + 9\quad no\)

7. \(3 + 11 - 5\quad yes\quad 6 + 7 + 9\quad no\)

Use the table to help answer these questions.

<table>
<thead>
<tr>
<th>Family Member</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grandmother</td>
<td>75</td>
</tr>
<tr>
<td>Aunt Ilene</td>
<td>48</td>
</tr>
<tr>
<td>Ethan</td>
<td>27</td>
</tr>
<tr>
<td>Justin</td>
<td>23</td>
</tr>
<tr>
<td>Lexi</td>
<td>5</td>
</tr>
<tr>
<td>Steve</td>
<td>4</td>
</tr>
</tbody>
</table>

9. The sum of Aunt Ilene’s and Ethan’s ages equals the age of another family member. Write an equation for this situation.

\(48 + 27 = \_
\)

10. Whose age will balance the equation?

Grandmother = Aunt Ilene + Justin + \_

Steve

Find the missing number in each equation.

1. \(7 + 5 = 7 + \_
\)
2. \(12 + 9 = 12 + \_
\)
3. \(15 + 6 = 4 + 11 + \_
\)
4. \(20 + 8 = 13 + 7 + \_
\)
5. \(36 + 3 = 20 + 16 + \_
\)
6. \(27 + 6 = 15 + 12 + \_
\)
7. \(48 + 4 = 22 + 26 + \_
\)
8. \(16 + 9 = 8 + 8 + \_
\)

9. Tyrone spins a spinner numbered 0 through 5. He spins a 3 and a 5 for a total of 8 points. Gloria spins a 5 on her first try. What number does Gloria need to spin to get a total equal to Tyrone?

\(3\)

10. Bonnie earned $14 and $18 dollars the last two times she babysat. Kara earned $10 and $4 the last two times she babysat. How much more money does Kara need to earn to equal the total amount Bonnie earned?

$18

Spiral Review

Use any strategy shown below to solve. Tell which strategy you used. (Lesson 3-5)

- Draw a picture
- Look for a pattern
- Make a table

11. Sarah can make 4 sandwiches in 10 minutes. If Sarah needs to make 16 sandwiches for a picnic, how long will it take her?

\(40 \text{ minutes; make a table}\)

12. Josh, Kayla and Anthony are volunteering at the pool for the summer. Josh can fold 3 towels in 10 minutes. Kayla can fold 5 towels in 10 minutes, and Anthony can fold 7 towels in 10 minutes. If they all fold towels together, how many towels can they fold in one hour?

\(90 \text{ towels; make a table}\)
The table below shows the price of David’s favorite activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>skate park</td>
<td>$4</td>
</tr>
<tr>
<td>movies</td>
<td>$9</td>
</tr>
<tr>
<td>go-carts</td>
<td>$13</td>
</tr>
<tr>
<td>pizza dinner</td>
<td>$17</td>
</tr>
<tr>
<td>amusement park</td>
<td>$34</td>
</tr>
</tbody>
</table>

1. The sum of going to the skate park and go-carting equals the price of another activity. Write an equation for this situation.

   \[ \text{skate park} + \text{go-carts} = \text{another activity} \]

   \[ $4 + $13 = $17 \]

2. David picks a movie and pizza dinner. His friend picks a movie and go-carts. Write an equation for this situation. Tell if it balanced.

   \[ \text{movie} + \text{pizza dinner} \neq \text{movie} + \text{go-carts} \]

   \[ $9 + $17 \neq $9 + $13 \]

The table below shows how many students voted for each activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>kickball</td>
<td>12</td>
</tr>
<tr>
<td>pizza lunch</td>
<td>15</td>
</tr>
<tr>
<td>extra recess</td>
<td>20</td>
</tr>
<tr>
<td>art time</td>
<td>8</td>
</tr>
</tbody>
</table>

3. The difference in votes between extra recess and art time equals the votes for another activity. Write an equation for this situation.

   \[ \text{extra recess} - \text{art time} = \text{another activity} \]

   \[ 20 - 8 = 12 \]

4. One class votes 6 for kickball and 14 for pizza. Another class votes 7 for art time and 11 for extra recess. Write the equation for this situation. Tell whether the equation is balanced.

   \[ \text{kickball} + \text{pizza} \neq \text{art time} + \text{extra recess} \]

   \[ 6 + 14 \neq 7 + 11 \]

   \[ 20 \neq 18 \]

---

**Enrich**

**A Word’s Worth**

Each letter in the word above is worth the number of points shown. Use the letters in the word “equations” to make at least 10 words, each worth a total of 25 points or more. You may not use any of the letters more than once in each word. Write an equation to show the value of each word.

For example, the word *squint* is worth $1 + 10 + 7 + 6 + 12 + 8 = 44$

1. **Sample answers include:** tone, saint, tin, tons

2. quiet \[ 10 + 7 + 6 + 5 + 8 = 36 \]

3. quit \[ 10 + 7 + 6 + 8 = 31 \]

4. quaint \[ 10 + 7 + 3 + 6 + 12 + 8 = 46 \]

5. note \[ 12 + 4 + 8 + 5 = 29 \]

6. ten \[ 8 + 5 + 12 = 25 \]

7. stone \[ 1 + 8 + 4 + 12 + 5 = 30 \]

8. stain \[ 1 + 8 + 3 + 6 + 12 = 30 \]

9. sat \[ 1 + 3 + 8 = 12 \]

10. sent \[ 1 + 5 + 12 + 8 = 26 \]
Vocabulary Test

Match each word to its definition. Write your answers on the lines provided.

1. expression _____________ A. when the amount on the left side of an equation is the same as the amount on the right side, both sides are equal

2. variable _______________ B. a combination of numbers, variables, and operation symbols that represents a mathematical quantity

3. parentheses ___________ C. a mathematical sentence that contains an equals sign, =, indicating that the left side of the equal sign has the same value as the right side

4. equation ______________ D. a sequence of numbers, figures, or symbols that follows a rule or design

5. balance _______________ E. a letter or symbol used to represent an unknown quantity

6. pattern _______________ F. tell you which operation to perform first

7. solve _________________ G. find the answer to a problem

Oral Assessment

Place 4 blue paper clips, 8 red paper clips, a paper cutout of the letter “X,” a paper cutout of a minus sign, a paper cutout of a plus sign and a paper cutout of an equals sign on the table. 4 blue paper clips will always be used. “X” will represent the number of red paper clips used. Use the materials to formulate the equations below.

Read each question aloud to the student. Then either record the student’s answers on the lines below the question, or have them write answers on another piece of paper.

1. How many blue paper clips are there?

4

2. What is 4 + x if x = 5?

9

3. What is 4 + x if x = 8?

12

4. Tell how you got your answer.
   Check Student’s response.

5. If you took 2 blue paper clips away, what is 2 + x if x = 3?

5

6. Tell how you got your answer.
   Check Student’s response.

7. Sam earned 13 points total in a game. The first half of the game he earned 8 points. How many points did he earn in the second half of the game? In this case, n = 8. What is the value of 13 – n if n = 8?

5

8. What is the value of 13 – n if n = 6?

7
9. Tell how you got your answer.
    **Check Student's response.**

10. What is the value of \(3 + n\) if \(n = 37\)?
    __6__

11. Tell how you got your answer.
    **Check Student's response.**

12. What is the value of \(3 + n\) if \(n = 0\)?
    __3__

13. What is the value of \(3 + n\) if \(n = 1\)?
    __4__

14. Tell how you got your answer.
    **Check Student's response.**
Chapter 3 Assessment Answer Key

<table>
<thead>
<tr>
<th>Chapter Diagnostic Assessment Page 39</th>
<th>Chapter Pretest Page 40</th>
<th>Quiz 1 Page 41</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 6</td>
<td>1. 23</td>
<td>1. 13</td>
</tr>
<tr>
<td>2. 2</td>
<td>2. 10</td>
<td>2. 18</td>
</tr>
<tr>
<td>3. 5</td>
<td>3. 37</td>
<td>3. (24 - q)</td>
</tr>
<tr>
<td>4. 6</td>
<td>4. 15</td>
<td>4. (h + 18)</td>
</tr>
<tr>
<td>5. 7</td>
<td>5. 17</td>
<td>5. (g = 8)</td>
</tr>
<tr>
<td>6. 7</td>
<td>6. 0</td>
<td>6. (h = 17)</td>
</tr>
<tr>
<td>7. 5</td>
<td>7. (p + 5; 25) minutes</td>
<td>7. (j = 5)</td>
</tr>
<tr>
<td>8. 9</td>
<td>8. (c - 45; 91) baseball cards</td>
<td>8. (m = 29)</td>
</tr>
<tr>
<td>9. 12</td>
<td>9. (8 - m = 5; 3) slices</td>
<td>9. (j + 12 = 21; 9)</td>
</tr>
<tr>
<td>10. 6</td>
<td>10. extra information: he eats at 5 P.M.; he eats 20 flakes of food a month</td>
<td>10. (a - 50 = 50; 100)</td>
</tr>
<tr>
<td>11. 13</td>
<td>11. missing information: ticket price; extra information: show time</td>
<td>11. 11 + e; 32 slices of pepperoni</td>
</tr>
<tr>
<td>12. 10</td>
<td>12. (34 - m = 27; 7) cookies</td>
<td>12. balanced</td>
</tr>
<tr>
<td>13. not balanced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. +2; 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. +5; 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. –3; 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. 48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Continued on the next page)
Chapter 3 Assessment Answer Key

Quiz 2  
Page 42

1. \[ a + 7 = b; \]
   \[ 15 \]
   \[ 18 \]
   \[ 21 \]

2. \[ f - 3 = g \]
   \[ 13 \]
   \[ 17 \]
   \[ 21 \]

3. \[ \text{Rule: } t + 7 = v \]

<table>
<thead>
<tr>
<th>Input (t)</th>
<th>Output (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>25</td>
<td>32</td>
</tr>
</tbody>
</table>

4. \[ \text{Rule: } w - 5 = x \]

<table>
<thead>
<tr>
<th>Input (w)</th>
<th>Output (x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>24</td>
<td>19</td>
</tr>
</tbody>
</table>

5. \[ \text{extra information: she usually has math homework;} \]
   \[ \text{42 minutes.} \]

6. \[ \text{missing information: how many grapes he ate.} \]

Quiz 3  
Page 43

1. 5

2. 8

3. 9

4. 4

5. yes

6. no

7. yes

8. 23 minutes  
   sample answer: draw a picture

9. 4 dozen  
   sample answer: make a table

10. B

11. C

12. A

13. \[ 6 + b \]

14. \[ n - 12 \]

15. \[ p - 7 \]

16. \[ 18 + w \]

17. \[ g = 7 \]

18. \[ h = 14 \]

19. \[ f = 7 \]

20. \[ r = 9 \]

21. \[ \text{extra information: the colors of the pencils; 12 pencils.} \]

22. \[ \text{missing information: Amount of time it takes to get to Jane's home.} \]

Mid-Chapter Review  
Page 44

1. \[ B \]

2. \[ C \]

3. \[ A \]

4. \[ 6 + b \]

5. \[ n - 12 \]

6. \[ p - 7 \]

7. \[ 18 + w \]

8. \[ g = 7 \]

9. \[ h = 14 \]

10. \[ f = 7 \]

11. \[ r = 9 \]

12. \[ \text{extra information: the colors of the pencils; 12 pencils.} \]

13. \[ \text{missing information: Amount of time it takes to get to Jane's home.} \]
Chapter 3 Assessment Answer Key

Form 1 Page 50

1. D
2. G
3. A
4. G
5. C
6. J
7. C
8. F

Form 2A Page 52

1. D
2. H
3. C
4. F
5. B
6. H
7. B
8. F

9. D

(Continued on the next page)
## Chapter 3 Assessment Answer Key

<table>
<thead>
<tr>
<th>Form 2A (Continued)</th>
<th>Form 2B</th>
<th>Form 2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page 53</td>
<td>Page 54</td>
<td>Page 55</td>
</tr>
<tr>
<td>10. <strong>H</strong></td>
<td>1. <strong>B</strong></td>
<td>9. <strong>B</strong></td>
</tr>
<tr>
<td>11. <strong>C</strong></td>
<td>2. <strong>F</strong></td>
<td>10. <strong>H</strong></td>
</tr>
<tr>
<td>12. <strong>G</strong></td>
<td>3. <strong>B</strong></td>
<td>11. <strong>A</strong></td>
</tr>
<tr>
<td>13. <strong>A</strong></td>
<td>4. <strong>H</strong></td>
<td>12. <strong>F</strong></td>
</tr>
<tr>
<td>14. <strong>J</strong></td>
<td>5. <strong>C</strong></td>
<td>13. <strong>B</strong></td>
</tr>
<tr>
<td>15. <strong>C</strong></td>
<td>6. <strong>F</strong></td>
<td>14. <strong>G</strong></td>
</tr>
<tr>
<td>16. <strong>G</strong></td>
<td>7. <strong>A</strong></td>
<td>15. <strong>A</strong></td>
</tr>
<tr>
<td>8. <strong>G</strong></td>
<td></td>
<td>16. <strong>H</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>17. <strong>B</strong></td>
</tr>
</tbody>
</table>

(Continued on the next page)
Chapter 3 Assessment Answer Key

Form 2C
Page 56

1. 23
2. 18
3. 8
4. 73
5. 14
6. 31
7. 13
8. 37
9. 203
10. $7

Page 57

11. 9
12. 2
tnickels
13. 7
14. 11
15. 19
16. 12
17. 34
models
18. 32
cans
19. 137
people
20. 746
words

Form 2D
Page 58

1. 24
2. 8
3. 13
4. 78
5. 11
6. 22
7. 28
flyers
8. 17, 19, 21
9. 146
pounds
10. $14

(Continued on the next page)
Chapter 3 Assessment Answer Key

Form 2D (Continued)
Page 59

11. 25

12. 4 nickels

13. 3

14. 27

15. 10

16. 9

17. 30

18. 18

19. $58

20. 72 pages

Form 3 Page 60

1. 37

2. 14

3. 20

4. 79

5. 29

6. 21

7. 25 packets

8. 34, 41, 49

9. 253 cups

10. $9

11. 16

12. 7 nickels

13. 13

14. 2

15. 28

16. 19

17. 28 posters

18. 11 shells

19. $57

20. 191 pages

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## Chapter 3 Assessment Answer Key

**Page 62, Extended-Response Test**

**Scoring Rubric**

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4</strong></td>
<td>The student demonstrates a <strong>thorough understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student has responded correctly to the task, used mathematically sound procedures, and provided clear and complete explanations and interpretations. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>The student demonstrates an <strong>understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is essentially correct with the mathematical procedures used and the explanations and interpretations provided demonstrating an essential but less than thorough understanding. The response may contain minor errors that reflect inattentive execution of the mathematical procedures or indications of some misunderstanding of the underlying mathematics concepts and/or procedures.</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>The student has demonstrated only a <strong>partial understanding</strong> of the mathematics concepts and/or procedures embodied in the task. Although the student may have used the correct approach to obtaining a solution or may have provided a correct solution, the student’s work lacks an essential understanding of the underlying mathematical concepts. The response contains errors related to misunderstanding important aspects of the task, misuse of mathematical procedures, or faulty interpretations of results.</td>
</tr>
<tr>
<td><strong>1</strong></td>
<td>The student has demonstrated a <strong>very limited understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is incomplete and exhibits many flaws. Although the student has addressed some of the conditions of the task, the student reached an inadequate conclusion and/or provided reasoning that was faulty or incomplete. The response exhibits many errors or may be incomplete.</td>
</tr>
<tr>
<td><strong>0</strong></td>
<td>The student has provided a <strong>completely incorrect</strong> solution or uninterpretable response, or no response at all.</td>
</tr>
</tbody>
</table>
**Chapter 3 Assessment Answer Key**

**Page 62, Extended-Response Test**

**Sample Answers**

*In addition to the scoring rubric found on page A25, the following sample answers may be used as guidance in evaluating open-ended assessment items.*

1. **a.** An expression is a math statement with numbers and symbols. An equation is a math statement with an equal sign. The equal sign shows that the expressions on each side are equal.
   
   **b.** \( x + 5 = 15 \)
   
   **c.** \( x = 10 \)

2. **a.** The question asks how many brownies Anna sold. The cost is not involved.
   
   **b.** No. The problem could not be solved because you would need to know the number of brownies this week and last week in order to come up with the answer.
   
   **c.** Yes. You can subtract 12 from 22 to find how many more brownies were sold. Then make a table to find how much money would be made from selling that number of brownies.

3. **a.** An equation is balanced when the amount on the left side of an equation is balanced or equal to the amount on the right side.
   
   **b.** Answers will vary, but the amount on either side of the equation should not be equal.
## Chapter 3 Assessment Answer Key

### Cumulative Standardized Test Practice Page 64

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>D</td>
</tr>
<tr>
<td>2.</td>
<td>G</td>
</tr>
<tr>
<td>3.</td>
<td>A</td>
</tr>
<tr>
<td>4.</td>
<td>G</td>
</tr>
<tr>
<td>5.</td>
<td>C</td>
</tr>
<tr>
<td>6.</td>
<td>F</td>
</tr>
<tr>
<td>7.</td>
<td>A</td>
</tr>
<tr>
<td>8.</td>
<td>H</td>
</tr>
<tr>
<td>9.</td>
<td>B</td>
</tr>
<tr>
<td>10.</td>
<td>H</td>
</tr>
<tr>
<td>11.</td>
<td>C</td>
</tr>
<tr>
<td>12.</td>
<td>H</td>
</tr>
<tr>
<td>13.</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>yes</td>
</tr>
<tr>
<td>15.</td>
<td>8</td>
</tr>
<tr>
<td>16.</td>
<td>6</td>
</tr>
<tr>
<td>17.</td>
<td>( n - 6 = 18 ) where ( n = 24 )</td>
</tr>
<tr>
<td>18.</td>
<td>8 raffle tickets</td>
</tr>
<tr>
<td>19.</td>
<td>$27</td>
</tr>
</tbody>
</table>