California Mathematics 5
Chapter 7 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 7 Assessment Line-up
- Answer Keys

All Answers Included
# Grade 5 Chapter 7
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Teacher’s Guide to Using the
Chapter 7 Resource Masters

The Chapter 7 Resource Masters includes the core materials needed for Chapter 7. 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. 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-Built 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 7–1. 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. 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 Computational 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.

**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.

**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. Some Enrich materials are designed to widen students’ perspectives on the mathematics they are learning. These worksheets are written for use with all levels of students.

Resources for Problem-Solving Strategy and Problem-Solving Investigation 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 Homework Strategy lesson, Reteach and 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 the Homework Practice and Skills Practice worksheets.

**Assessment Options** The assessment masters in the *Chapter 7 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.

**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.

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

**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.

**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.
- **Form 2A** 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.
- **Form 2D** is written for students with a below-level command of the English language.
- **Form 3** is a free-response test.
- **Extended-Response Test** is an extended response test.

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

**Cumulative Standardized Test Practice** This three-page test, aimed at on-level students, offers multiple-choice questions and 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 7: Algebra: Integers and Equations**. Fill in the missing information.

<table>
<thead>
<tr>
<th>To do this:</th>
<th>Remember the rule(s):</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>subtract an integer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>multiply or divide integers of different signs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>multiply or divide integers of the same sign</td>
<td></td>
<td></td>
</tr>
<tr>
<td>solve an addition or subtraction equation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>solve a multiplication equation</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 7: Algebra: Integers and Equations**. 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>coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inverse operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>opposites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>ordered pair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>quadrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zero pair</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dear Family,

Today my class started Chapter 7: Algebra: Integers and Equations. I will be learning to add, subtract, multiply, or divide integers to solve problems and justify solutions. Here are my vocabulary words and an activity that we can do together.

Sincerely, ______________________

Key Vocabulary

**Coefficient:** The number by which $x$ is multiplied. Example: In $3x$, 3 is the coefficient.

**Inverse operation:** Operations that undo each other. Example: Addition and subtraction are inverse or opposite operations.

**Quadrants:** One of four sections of a coordinate graph formed by two axes.

**Zero pair:** A pair of counters that includes one positive counter and one negative counter.

**Opposites:** Numbers that are the same distance from zero in opposite directions.

**Ordered pair:** A pair of numbers that are the coordinates of a point in a coordinate plane or grid in this order (horizontal coordinate, vertical coordinate). Example: (4, 0).

**Equation:** A mathematical sentence that contains an equal sign, $=$, indicating that the left side of the equal sign has the same value as the right side.

Activity

Use construction paper to make cards with the integers 2, 3, −3, 5, −2, 9, and −1. Put them in number order. Repeat activity by making new cards with new integers, and then putting them in number order.

Books to Read

**Splash**
by Ann Jonas

**A Grain of Rice**
by Helena Clare Pittman

**On Beyond A Million**
by David Schwartz
Estimada familia:

Hoy mi clase comenzó el Capítulo 7: El álgebra: Los enteros y las ecuaciones. Aprendere a sumar, a restar, a multiplicar o a dividir enteros para resolver problemas y justificar soluciones. A continuación, están mis palabras del vocabulario y una actividad que podemos realizar juntos.

Sinceramente, ________________ 

Vocabulario clave

**Coeficiente:** Número por el cual se multiplica x.

**Operaciones inversas:** Operaciones que se anulan entre sí.

**Cuadrantes:** Una de las cuatro secciones de una gráfica de coordenadas formada por dos ejes

**Par nulo:** Par de fichas que incluye una ficha positiva y otra negativa

**Opuestos:** Números equidistantes de cero en direcciones opuestas

**Par ordenado:** Par de números que son coordenadas de un punto en un plano de coordenadas o un cuadrículado, en este orden (coordenada horizontal, coordenada vertical).

**Ecuación:** Enunciado matemático que contiene un signo de igualdad, =, que indica que el lado izquierdo del signo tiene el mismo valor que el lado derecho

**Actividad**

Usen cartulina para hacer fichas con los enteros 2, 3, -3, 5, -2, 9, y -1. Colóquenlas en orden numérico. Para repetir la actividad, hagan fichas nuevas con enteros nuevos y luego colóquenlas en orden numérico.

Libros recomendados

*Splash!*  
de Ann Jonas

*A Grain of Rice*  
de Helena Clare Pittman

*On Beyond A Million*  
de David Schwartz
**Anticipation Guide**

*Algebra: Integers and Equations*

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**STEP 1**

**Before you begin Chapter 7**

- 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>STEP 1 A, D, or NS</th>
<th>Statement</th>
<th>STEP 2 A or D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In the expression (3x), 3 is the coefficient.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Addition is the inverse operation for subtraction.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>A quadrant is one of four sections of a coordinate graph formed by two axes.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Subtraction is the inverse operation for division.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>A zero pair is a pair of counters that includes one positive counter and one negative counter.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Opposites are numbers that are the same distance from zero in opposite directions.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>An ordered pair is a pair of numbers that are the coordinates of a point in a coordinate plane or grid in this order (horizontal coordinate, vertical coordinate).</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>An equation is a mathematical sentence that contains an equal sign, =, indicating that the left side of the equal sign has the same value as the right side.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>In the expression (4x), 2 is the coefficient.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>In the expression (6x), (x) is the coefficient.</td>
<td></td>
</tr>
</tbody>
</table>

---

**STEP 2**

**After you complete Chapter 7**

- 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.
A Maze of Numbers

You will need:
A different type of coin for each player
Number cube
Paper and pencil

1. Place the coins at the start, outside the box.

2. Toss the number cube. The player with the greatest number becomes player 1. Players take turns in a clockwise fashion.

3. Have player 1 toss the number cube and count the number of boxes on the game board, following the arrows. If player 1 is able to correctly solve the equation in the box landed on, player 1 moves his or her coin to that box. If player 1 is not able to solve the equation correctly, she or he stays at the current position.

4. Take turns tossing and solving problems. The first player to reach the end and to correctly solve the final equation wins the game.
Reteach

Ordering Integers

An integer is a whole number or its opposite. You can use a number line to show integers.

Opposite integers, like –4 and 4, are the same distance from 0. For two integers on a number line, the greater integer is farther to the right.

You can use a number line to compare integers. Compare –2 and 1. You can see that 1 is farther to the right.

So, 1 > –2 or –2 < 1.

Write < or > to make a true sentence.

1. –3 □ 5
2. 9 □ –10
3. –6 □ 0
4. 5 □ –5
5. –2 □ –8
6. 5 □ 9
7. 8 □ –3
8. 7 □ –7
9. 0 □ 4

Order each set of integers from least to greatest.

10. 2, –3, 0 □ □ □
11. –2, 3, –4 □ □ □
12. –14, 14, –17, 28 □ □ □ □
13. –42, 44, –47, 48 □ □ □ □
14. –62, 58, –17, 13 □ □ □ □
15. 72, –77, –79, 71 □ □ □ □
Skills Practice
Ordering Integers

Write < or > to make a true sentence.

1. −2 □ 4  
2. 3 □ −7  
3. −6 □ −9  
4. −5 □ 1  
5. 6 □ −8  
6. −4 □ 0  
7. −3 □ −10  
8. 6 □ −6  
9. −12 □ −10  
10. 13 □ −17  
11. 0 □ −17  
12. −14 □ 21  
13. −9 □ 8  
14. 14 □ −14  
15. −19 □ 17  
16. 23 □ −25  
17. −18 □ −16  
18. 13 □ −14  
19. 25 □ −26  
20. 32 □ −41

Order each set of integers from least to greatest.

21. 33, −34, 38

22. 9, −17, −13

23. 21, −19, 20, −21

24. 52, −61, 63, −64

Solve.

25. The low temperature on Saturday was −5°F. The low temperature on Sunday was −9°F. Which day was colder?

26. On one play a football team moved the ball −6 yards. On the next play, they moved the ball exactly the opposite. Did they gain or lose yards on the second play? How many yards?
Replace each \( \bigcirc \) with < or > to make a true sentence.

1. \(-5 \bigcirc 0\)  
2. \(25 \bigcirc -15\)  
3. \(60 \bigcirc 40\)  
4. \(12 \bigcirc 10\)  
5. \(4 \bigcirc -5\)  
6. \(19 \bigcirc 18\)  
7. \(-6 \bigcirc -3\)  
8. \(75 \bigcirc 90\)  
9. \(-3 \bigcirc -2\)  
10. \(83 \bigcirc 59\)  
11. \(-41 \bigcirc 43\)  
12. \(87 \bigcirc -87\)

Order each set of integers from least to greatest.

13. \(14, 11, 2, 8, 9\)  
14. \(-50, 167, -240, 34, 17, 95\)  
15. \(-68, -113, 2, 89, 62, 7, -90\)  
16. \(7, 81, 5, -5, 100, 64\)  
17. \(37, -90, 9, 16, 25, 432, -900\)

Solve.

18. Anya, Carolina, and Maria are all waiting for their trains to arrive. Anya’s train will arrive at 11 A.M., Carolina’s train will arrive at 11:30 A.M., and Maria’s train will arrive an hour before Carolina’s. Order the three by who will arrive first.

---

Divide. Write in simplest form. (Lesson 6–11)

19. \(5 \frac{3}{5} \div \frac{2}{3}\)  
20. \(12 \div \frac{3}{4}\)  
21. \(\frac{4}{9} \div \frac{1}{8}\)
Problem-Solving Practice

Ordering Integers

Solve.

1. Two people are waiting for their trains to arrive. The first person has to wait 23 minutes, and the second person has to wait 5 minutes. Who has the longest wait?

2. On Monday, in Maine the temperature fell to –20°F, and in Vermont the temperature fell to 0°F. Which state is colder?

3. Juan's test scores are: 100, 91, 98, 54, 75, 0. Order the set of scores from least to greatest.

4. On her test sheet, in the box marked **Number Wrong**, Olivia got a –10 and Yolanda got a –20. Who has the lower score, Olivia or Yolanda?

5. At 7:00 A.M., the temperature was –9°C. At noon, the temperature was 0°C. At 6:00 P.M., the temperature was –10°C. At what time was the temperature the coldest?

6. In a go-cart race, Miguel’s time was 50 seconds less than the average time. Danny’s time was 30 seconds less than the average time. Who had the fastest time?
1. Write an integer to show the location for each item.
   - porpoise _______    sea horse _______
   - bird _______    octopus _______
   - eel _______    clouds _______
   - flag _______    jellyfish _______

2. Write the opposite for each integer. Tell what can be found in that location.
   - 2 _______    7 _______
   - 4 _______    4 _______
   - 9 _______    6 _______
   - 3 _______    6 _______

3. Compare the locations of each pair. Circle the location showing the greater integer.
   - sea horse, porpoise
   - clouds, eel
   - eel, flag
   - sail of boat, bottom of ocean
   - buoy, octopus
   - bird, sea horse

4. Order the integers from least to greatest.
   - 9, 6, 3, −2, −12, 7, −8, 1, 10, 0, −11, −3
Reteach

Adding Integers

You can use a number line to add integers. Move to the right to add positive integers. Move to the left to add negative integers.

Add $4 + (-6)$.

Graph 4 on the number line. Add $-6$. Move 6 places to the left from 4. Read your final position on the number line.

$$4 + (-6) = -2$$

Rules for Adding Integers

<table>
<thead>
<tr>
<th>The sum of two positive integers is positive.</th>
<th>$6 + 8 = 14$</th>
</tr>
</thead>
<tbody>
<tr>
<td>The sum of two negative integers is negative.</td>
<td>$-14 + (-6) = -20$</td>
</tr>
<tr>
<td>The sum of a positive integer and a negative integer has the sign of the integer farther from 0.</td>
<td>$-14 + 8 = -6$</td>
</tr>
</tbody>
</table>

Add.

1. $-8 + 7 = _____$
2. $14 + (-3) = _____$
3. $-8 + 8 = _____$
4. $16 + 4 = _____$
5. $1 + 0 = _____$
6. $6 + (-8) = _____$
Skills Practice
Adding Integers

Add.

1. \(-12 + 5 = \)_______
2. \(-7 + (-5) = \)_______
3. \(10 + 6 = \)_______

4. \(-15 + 15 = \)_______
5. \(11 + (-13) = \)_______
6. \(-10 + 2 = \)_______

7. \(17 + (-19) = \)_______
8. \(-20 + 4 = \)_______
9. \(10 + (-11) = \)_______

10. \(-4 + 16 = \)_______
11. \(7 + (-14) = \)_______
12. \(-14 + 8 = \)_______

13. \(30 + (-8) = \)_______
14. \(-12 + 2 = \)_______
15. \(13 + (-7) = \)_______

16. \(-21 + 12 = \)_______
17. \(4 + (-4) = \)_______
18. \(7 + (-8) = \)_______

19. \(1 + (-7) = \)_______
20. \(3 + (-6) = \)_______
21. \(-2 + (-3) = \)_______

Solve.

22. Steve is standing at sea level. He walks 9 feet down, then 4 feet up, then 3 feet down a tunnel. How many feet above or below sea level is he standing now? Write the answer as an integer.

23. The temperature at 8 A.M. was \(-5\)°C. At 10 A.M. the temperature was 3°C warmer. At 4 P.M. the temperature was 4°C colder than at 10 A.M. What was the temperature at 4 P.M.?
Adding Integers

Add.

1. \(+3 + (+4)\)  
2. \(+9 + (+8)\)  
3. \(6 + (-12)\)  
4. \(+9 + (+15)\)  
5. \(-7 + (+17)\)  
6. \(2 + (-1)\)  
7. \(+13 + (-4)\)  
8. \(+4 + (-7)\)  
9. \(-5 + (-15)\)  

Solve.

10. The temperature outside is \(-2^\circ F\). If the temperature rises 2 degrees, what will the temperature be?  

11. At halftime in a football game, team A has lost 16 yards \((-16)\) and team B has lost 32 yards \((-32)\). How many total yards were lost? Write as an integer.  

Spiral Review

Replace each \(\bigcirc\) with < or > to make a true sentence. (Lesson 7–1)

12. \(-80\) \(\bigcirc\) 80  
13. 6 \(\bigcirc\) 5  
14. \(-99\) \(\bigcirc\) 7  
15. \(-8\) \(\bigcirc\) 0  
16. \(-202\) \(\bigcirc\) \(-252\)  
17. 12 \(\bigcirc\) 8  
18. \(-25\) \(\bigcirc\) \(-20\)  
19. 75 \(\bigcirc\) 85  
20. 43 \(\bigcirc\) \(-86\)  

Order each set of integers from least to greatest.

21. 54, 52, \(-2\), \(-8\), 91  
22. \(-70\), 22, \(-80\), 34, 756, \(-965\)  
23. \(-4\), \(-13\), 2, \(-9\), 52, 24, \(-90\)
Solve.

1. Before halftime in a football game, a team scored 21 points. After halftime, the team scored 6 more points. How many points did the team score?

2. The temperature outside is 80°F. If the temperature rises 10ºF, what will the temperature be?

3. The temperature in Tahoe is −1°C. If the temperature falls 6°C, what will the temperature be?

4. Diego and Ana are playing a board game. They both start on the same square. Diego first moves forward 2 squares, and on his next turn he moves backward 1 square. On her first turn, Ana moves forward 6 squares, and on her next turn she moves forward 4 squares. Who is ahead?

5. Later in the game, Ana is forced to move back 10 squares, but then gains 1 square. How many squares back is she?

6. During the next 6 plays, Diego loses 12 squares, but he also gains 12 squares. How many squares does he gain?
One African-American inventor of the late nineteenth century had many patents. Who was he and which patent of 1890 became a common household item?

Find the sum of the number in the center of each ring and each of the numbers in the middle ring. Write the sum in the corresponding space in the outer ring.

1. 
   ![Diagram 1]

2. 
   ![Diagram 2]

3. 
   ![Diagram 3]

4. 
   ![Diagram 4]

5. 
   ![Diagram 5]

6. 
   ![Diagram 6]

Circle the letter of each negative sum in the outer ring. Starting at the arrow and moving in a clockwise direction, write each circled letter in the blanks below.

The inventor's name was ______ _____ _____ _____ _____ _____

and his most famous invention was the

____ ____ ____ ____ ____ ____ ____ ____
Reteach

Subtracting Integers

To subtract an integer, add its opposite.

Subtract $5 - 8$.
Add the opposite. Use the number line to find $5 + (-8)$.
Remember: Move to the left on the number line to add negative numbers.

So, $5 - 8 = -3$.

Subtract $-2 - (-4)$.
Add the opposite. Use the number line to find $-2 + 4$.
Remember: Move to the right on the number line to add positive numbers.

So, $-2 - (-4) = 2$.

Subtract. You may use the number line.

1. $-7 - 2 = \underline{\hspace{1cm}}$
2. $6 - (-3) = \underline{\hspace{1cm}}$
3. $14 - (-5) = \underline{\hspace{1cm}}$

4. $-2 - 1 = \underline{\hspace{1cm}}$
5. $-9 - (-4) = \underline{\hspace{1cm}}$
6. $-9 - 0 = \underline{\hspace{1cm}}$

7. $-7 - (-2) = \underline{\hspace{1cm}}$
8. $-3 - (-5) = \underline{\hspace{1cm}}$
9. $10 - (-9) = \underline{\hspace{1cm}}$

10. $-5 - 3 = \underline{\hspace{1cm}}$
11. $0 - (-8) = \underline{\hspace{1cm}}$
12. $16 - (-6) = \underline{\hspace{1cm}}$

13. $7 - (-2) = \underline{\hspace{1cm}}$
14. $7 - (-4) = \underline{\hspace{1cm}}$
15. $-8 - 12 = \underline{\hspace{1cm}}$
Subtracting Integers

Subtract.

1. $3 - (-6) = \underline{\hspace{1cm}}$
2. $-3 - (-6) = \underline{\hspace{1cm}}$
3. $-8 - 2 = \underline{\hspace{1cm}}$
4. $-7 - 4 = \underline{\hspace{1cm}}$
5. $-5 - 6 = \underline{\hspace{1cm}}$
6. $15 - (-4) = \underline{\hspace{1cm}}$
7. $3 - (-12) = \underline{\hspace{1cm}}$
8. $5 - (-5) = \underline{\hspace{1cm}}$
9. $14 - 16 = \underline{\hspace{1cm}}$
10. $-12 - 6 = \underline{\hspace{1cm}}$
11. $2 - (-4) = \underline{\hspace{1cm}}$
12. $8 - 3 = \underline{\hspace{1cm}}$
13. $8 - (-2) = \underline{\hspace{1cm}}$
14. $-10 - 2 = \underline{\hspace{1cm}}$
15. $9 - (-3) = \underline{\hspace{1cm}}$
16. $-4 - 3 = \underline{\hspace{1cm}}$
17. $8 - (-9) = \underline{\hspace{1cm}}$
18. $8 - (-4) = \underline{\hspace{1cm}}$
19. $-5 - (-5) = \underline{\hspace{1cm}}$
20. $-5 - 5 = \underline{\hspace{1cm}}$
21. $-12 - (-7) = \underline{\hspace{1cm}}$
22. $-7 - (-2) = \underline{\hspace{1cm}}$
23. $19 - 3 = \underline{\hspace{1cm}}$
24. $-10 - (-5) = \underline{\hspace{1cm}}$

Solve.

25. After a rocket reached an altitude of 13,480 ft, it separated from the main engines. The engines sank into the ocean to a depth of -1,550 ft. How far did the engines fall?

26. When an airplane flew at an altitude of 5,000 ft, the temperature was $-15^\circ F$ outside. When the airplane reached an altitude of 10,000 ft, the temperature was $-28^\circ F$ outside. What was the difference in temperature?
Subtract.

1. $7 - 2$  
2. $-9 - (-5)$  
3. $-4 - (-4)$  
4. $-9 - 10$  
5. $-7 - (-3)$  
6. $0 - (-1)$  
7. $-15 - 8$  
8. $-9 - (-3)$

ALGEBRA

9. Evaluate $a - b$ if $a = 8$, and $b = 10$. ______

10. Find the value of $m - n$ if $m = -5$, and $n = 10$ ______

Add. (Lesson 7–2)

11. $-7 + 2$  
12. $+9 + (-5)$  
13. $-4 + (-10)$  
14. $+9 + (-18)$  
15. $-7 + (-3)$  
16. $0 + (-1)$  
17. $+15 + 8$  
18. $-9 + (-3)$

Solve.

19. The temperature outside is $23^\circ$C. If the temperature drops 24 degrees, what will the temperature be?

20. At the start of a board game, with both players starting in the same square, Mary moved forward 8 squares and on her next turn backward 7 squares. On his first turn, Joe didn’t move at all, but moved 2 squares on his second turn. Who is ahead?
Solve.

1. Jan receives $15 every week for her allowance. She has to spend $10 a week for lunches and $2 a week to ride the bus. How much money does she have left each week?

2. One week, Jan got her usual $15 allowance. She spent $10 on lunches and $2 to ride the bus. She wants to buy a hat for $15. How much more money does Jan need?

3. Jose and Juan are contestants on a game show. Currently, Jose has 24 points, and Juan has –4 points. How many more points does Jose have than Juan?

4. Bernice ran a mile in 20 seconds more than her average time. Yesterday, she ran a mile in 10 seconds more than her average time. What is the difference between these times?

5. John earns $40 every week by mowing grass. This week, he spent $35 on sneakers. How much money does John have left?

6. John ran 5 miles every day the first week he started running. Now, he can run 10 miles every day. How many more miles can John now run each day?
I am a two-digit number. My tens digit is greater than my ones digit. The difference of my digits is 1.

Shade in the boxes that contain a correct answer below the subtraction. Now you can find out what number I am.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>-18</td>
<td>-14</td>
<td>28</td>
<td>-21</td>
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<td>48</td>
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<td>-15</td>
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<td>41</td>
<td>-11</td>
<td>30</td>
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<tr>
<td>-3</td>
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<td>-11</td>
<td>7</td>
<td>-12</td>
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<td>-4</td>
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<td>-31</td>
<td>-12</td>
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<td>32</td>
<td>-29</td>
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<tr>
<td>-3</td>
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</tbody>
</table>
Reteach
Multiplying Integers

You can use these rules to multiply integers:

- If the signs of the integers are the same, the product is positive.  
  \(-3 \times (-2) = 6\)  
  \(4 \times 6 = 24\)
- If the signs of the integers are different, the product is negative.  
  \(-3 \times 5 = -15\)  
  \(2 \times (-6) = -12\)

The chart shows the properties of multiplication of integers.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commutative Property for Multiplication</td>
<td>For any integers (a) and (b), (ab = ba). (-2 \times 4 = 4 \times -2)</td>
</tr>
<tr>
<td>Associative Property for Multiplication</td>
<td>For any integers (a), (b), and (c), ((a \times b) \times c = a \times (b \times c)). ((-2 \times 3) \times -5 = -2 \times (3 \times -5))</td>
</tr>
<tr>
<td>Identity Property for Multiplication</td>
<td>For any integer (a), (a \times 1 = a). (-8 \times 1 = -8)</td>
</tr>
<tr>
<td>Zero Property for Multiplication</td>
<td>For any integer (a), (a \times 0 = 0). (-9 \times 0 = 0)</td>
</tr>
</tbody>
</table>
| Distributive Property of Multiplication over Addition | For any integers \(a\), \(b\), and \(c\),  
  \(a \times (b + c) = (a \times b) + (a \times c)\).  
  \(-3 \times (5 + (-2)) = (-3 \times 5) + (-3 \times -2)\) |

Multiply.

1. \(7 \times (-2) = \)_______  
2. \(5 \times 8 = \)_______  
3. \(9 \times (-3) = \)_______

4. \(5 \times (-3) = \)_______  
5. \(-8 \times 6 = \)_______  
6. \(-5 \times (-3) = \)_______

7. \(4 \times 8 = \)_______  
8. \(-2 \times (-9) = \)_______  
9. \(-3 \times (-6) = \)_______

10. \(-6 \times (-6) = \)_______  
11. \(-9 \times (-3) = \)_______  
12. \(-6 \times (-2) = \)_______

13. \(-10 \times 6 = \)_______  
14. \(-5 \times 4 = \)_______  
15. \(8 \times (-5) = \)_______
Name __________________________ Date __________________

7–4

Skills Practice

Multiplying Integers

Multiply.

1. $8 \times (-3) = ____$
2. $-3 \times (-10) = ____$
3. $10 \times (-4) = ____$
4. $2 \times (-5) = ____$
5. $9 \times (-9) = ____$
6. $-9 \times (-7) = ____$
7. $8 \times (-6) = ____$
8. $-7 \times 8 = ____$
9. $7 \times (-3) = ____$
10. $-13 \times 1 = ____$
11. $-3 \times (-6) = ____$
12. $-2 \times (-2) = ____$
13. $-3 \times (-13) = ____$
14. $10 \times (-5) = ____$
15. $5 \times (-4) = ____$
16. $-4 \times (-8) = ____$
17. $9 \times (-4) = ____$
18. $-4 \times (-11) = ____$
19. $2 \times (-2) \times 8 = ____$
20. $3 \times (-4) \times 6 = ____$
21. $6 \times (-3 \times 3) = ____$
22. $13 + [9 \times (-6)] = ____$
23. $10 \times (-4) + [5 - (-6)] = ____$
24. $16 - [5 \times (-5)] = ____$

Solve.

25. Which has the greatest product: $5 \times (-5)$ or $-5 \times (-5)$?

26. The price of stock in the Omega Company for Monday went up $5 per share. If Judy owns 32 shares, how much did her stock holdings change in value? Write this as an integer.
7–4
Homework Practice
Multiplying Integers

Multiply.
1. \(3 \times (-4)\) _____
2. \(-9 \times (-8)\) _____
3. \(6 \times (-12)\) _____
4. \(-9 \times (5)\) _____
5. \(-1 \times (-17)\) _____
6. \(-2 \times (-10)\) _____
7. \(12 \times (4)\) _____
8. \(4 \times (-7)\) _____
9. \(-5 \times 5\) _____
10. \(3 \times (-1)\) _____

ALGEBRA
11. Evaluate \(st\) if \(s = -5\) and \(t = 7\). _____
12. Find the value of \(ab\) if \(a = -10\) and \(b = -3\). _____

Spiral Review
Subtract. (Lesson 7–3)
13. \(12 - 2\) _____
14. \(-7 - (-5)\) _____
15. \(-14 - 4\) _____
16. \(-8 - 5\) _____
17. \(0 - (-8)\) _____
18. \(-16 - (-1)\) _____

Solve.
19. Jim receives $25 every week for his allowance. He has to spend $10 a week for lunches and $2 to ride the bus to his music lesson. How much does he have left?

20. One week, Jim received his usual $25 allowance. He spent his usual $10 for lunches and $2 to ride the bus. Jim also bought a DVD for $18. How much money did Jim need to borrow to buy the DVD?
1. For the past 5 years, the population of a city has decreased by 16 people a year. What is the city’s population loss in relation to 5 years ago?

2. Rey forgot his lunch money for the past 4 days and borrowed money from the cafeteria. If lunch costs $2.25, write an integer to show his balance for the past 4 days.

3. Lina is reading a novel. She reads 29 pages each night for 6 nights. Write an integer to show the number of pages that Lina has read.

4. The temperature in Carla’s city is decreasing. For the past 9 days, the temperature has decreased by 3 degrees Fahrenheit each day. Write an integer to show how much the temperature has decreased.

5. A public school loses 20 students each year due to transfers. If this pattern continues for the next 2 years, what will be the loss in relation to the original enrollment?

6. Ozzy and Paul discovered a buried treasure. For 10 days, they removed 5 cubic meters of dirt each day from the site. What integer represents the change in the amount of soil at the site?
**Enrich**

**Negative Exponents**

Magic square entries can be converted to exponents to create Exponent Squares, which can be made into Multi-Magic Squares. The products of the numbers in each row, column, or diagonal are the same in a Multi-Magic Square.

<table>
<thead>
<tr>
<th>Addition Square</th>
<th>Convert to exponents.</th>
<th>Complete Multi-Magic Square.</th>
</tr>
</thead>
<tbody>
<tr>
<td>−1 4 3</td>
<td>2⁻¹ 2⁴ 2³</td>
<td>1/2 16 8</td>
</tr>
<tr>
<td>6 2 −2</td>
<td>2⁶ 2² 2⁻²</td>
<td>64 4 1/4</td>
</tr>
<tr>
<td>1 0 5</td>
<td>2¹ 2⁰ 2⁵</td>
<td>2 1 32</td>
</tr>
</tbody>
</table>

Find the product of the Multi-Magic Square above. ________

Complete the squares.

1. **Addition Square**

<table>
<thead>
<tr>
<th>−2</th>
<th>3</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>−3</td>
</tr>
<tr>
<td>0</td>
<td>−1</td>
<td>4</td>
</tr>
</tbody>
</table>

   **Convert to exponents. Use a base of 2.**

   *Multi-Magic Square*

<table>
<thead>
<tr>
<th>3⁰</th>
<th>3⁵</th>
<th>3⁻²</th>
</tr>
</thead>
<tbody>
<tr>
<td>3⁻¹</td>
<td>3¹</td>
<td>3³</td>
</tr>
<tr>
<td>3⁴</td>
<td>3⁻³</td>
<td>3²</td>
</tr>
</tbody>
</table>

   **Product:** ________

2. **Multi-Magic Square**

<table>
<thead>
<tr>
<th>3⁰</th>
<th>3⁵</th>
<th>3⁻²</th>
</tr>
</thead>
<tbody>
<tr>
<td>3⁻¹</td>
<td>3¹</td>
<td>3³</td>
</tr>
<tr>
<td>3⁴</td>
<td>3⁻³</td>
<td>3²</td>
</tr>
</tbody>
</table>

   **Product:** ________
Work Backward

A scientist plans to study exotic birds in the rain forest. The helicopter flight to and from the rain forest costs $499. Supplies cost $112 for each day. How many days can the scientist spend in the rain forest on a $1,283 budget?

<table>
<thead>
<tr>
<th>Step 1 Understand</th>
<th>Be sure you understand the problem.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Read carefully.</td>
</tr>
<tr>
<td>What do you know?</td>
<td>A helicopter flight costs __________.</td>
</tr>
<tr>
<td></td>
<td>Supplies cost __________.</td>
</tr>
<tr>
<td></td>
<td>The budget is __________.</td>
</tr>
<tr>
<td>What do you need to find?</td>
<td>The __________ in the rain forest.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2 Plan</th>
<th>Make a plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Choose a strategy.</td>
</tr>
<tr>
<td></td>
<td>You can work backward to find the number of days the scientist can stay in the rain forest.</td>
</tr>
<tr>
<td></td>
<td>Use math operations to undo each step.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3 Solve</th>
<th>Carry out your plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Decide which operation undoes each step.</td>
</tr>
<tr>
<td></td>
<td>Undo the addition of the cost of the helicopter.</td>
</tr>
</tbody>
</table>
|              | Which operation undoes addition? ______
|              | ______ the cost of the helicopter from the total budget: ____________
|              | The scientist has ______ left after paying for the helicopter. |
|              | Undo the multiplication of the number of days the scientist can stay in the rain forest. |
|              | Which operation undoes multiplication? ______
|              | ______ the amount remaining by the cost of supplies for each day.
|              | ________________________ days |
|              | How many days can the scientist stay in the rain forest? ______|
### Problem-Solving Strategy (continued)

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Is the solution reasonable?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>Reread the problem.</td>
</tr>
<tr>
<td></td>
<td>Have you answered the question?</td>
</tr>
<tr>
<td></td>
<td>How can you check your answer?</td>
</tr>
</tbody>
</table>

### Solve. Use the work backward strategy.

1. Ms. Robin’s class is planting trees for Arbor Day. They raise a total of $80 to buy trees and supplies. A local nursery has offered to provide trees for $7 each. They spend $17 on supplies. How many trees do they buy?

2. Mr. Stone’s class visits the aquarium. Mr. Stone has $46 for the trip. The entrance fee for the class is $34. The rest of the money is used to buy posters for the classroom. Each poster costs $3. How many posters does Mr. Stone buy?
Work Backward

Solve. Use the work backward strategy.

1. Ms. Houston’s fifth grade class is going to a dinosaur park. The class raises $68 for the trip. Transportation to the park costs $40. The park sells small fossils for $4 each. How many fossils can they buy with the money they have left?

2. Time Kusuo’s baseball game begins at 5:00 P.M. Kusuo wants to arrive 45 minutes early to warm up. If it takes him $\frac{1}{2}$ hour to get to the baseball field, what time should Kusuo leave his home for the game?

Use any strategy to solve.

3. A theater seats 44 people. For Friday evening performances, 128 tickets were sold. How many performances were there on Friday evening?

4. Science Many huskies have one brown eye and one blue eye and others have two blue eyes. In a group of 22 huskies, there were 38 blue eyes. How many of the dogs have two blue eyes?

5. Number Sense Steffy picks a number, subtracts 13, and then multiplies the difference by 2. Finally, she adds 8 to the product. Her final number is 122. What was her starting number?

6. Create a problem for which you could work backward to solve. Share it with others.
Work Backward

Solve. Use the work backward strategy.

1. A number is divided by 3. Next, 2 is subtracted from the quotient. Then, 4 is added to the difference. If the result is 12, what is the number?

2. Rey has $5 in change after buying a hamburger for $3.50 and a drink for $1.50. How much money did Rey have originally?

3. Akiko is 5 years older than her brother Tai. Tai is 3 years older than their sister Kin. Kin is 6 years older than their brother Taro. If Taro is 15 years old, how old is Akiko?

4. Lina is 15 years older than Alberto. Alberto is 5 years older than Sonia. Sonia is 8 years older than Ernesto. If Ernesto is 5 years old, how old is Lina?

Spiral Review

Multiply. (Lesson 7–4)

5. $10 \times (-2)$
6. $3 \times (6)$
7. $4 \times (-2)$
8. $9 \times (-9)$
9. $-16 \times (-1)$
10. $-6 \times (-10)$
11. $12 \times (-4)$
12. $8 \times (-7)$
13. $-9 \times 6$
If the solutions to the equations are incorrect, cross out the letters in the box below. The remaining letters will spell out a message.

B. $2x + 1 + 4 = 9 \quad x = 3$ \quad P. $7 = \frac{2}{9}c - 1 \quad c = 18$

I. $3m + 4m = 21 \quad m = 3$ \quad C. $9 = \frac{x}{14} \quad x = 184$

L. $13 = 5 + 4y \quad y = 12$ \quad O. $2(y - 7) = 0 \quad y = 7$

X. $2(x + 1) = 5 \quad x = 3$ \quad K. $6(a + 4) = 110 \quad a = 16$

W. $2 + 3x = 5 \quad x = 1$ \quad F. $\frac{3}{4}m + 1 = 9 \quad m = 12$

S. $8x - 3x = 20 \quad x = 4$ \quad E. $5n - 21 = 24 \quad n = 9$

M. $15 = 2(n + 1) \quad n = 6$ \quad H. $2(y - 6) = 4 \quad y = 8$

N. $11 = 3 + 4y \quad y = 2$ \quad J. $2x - 8 = 10 \quad x = 8$

R. $4m + 2m + 3 = 15 \quad m = 2$ \quad Q. $3(x - 7) = 32 \quad x = 13$

G. $\frac{3}{7}n - 5 = 4 \quad n = 21$ \quad T. $6(m - 35) = 6 \quad m = 36$

D. $27 = 11p + 9 \quad p = 2$ \quad U. $78 = 9w - 7w + 6 \quad w = 36$

V. $\frac{5}{8}a + 30 = 35 \quad a = 8$ \quad Y. $\frac{3}{5}f - 7 = 8 \quad f = 25$

<table>
<thead>
<tr>
<th>P</th>
<th>Y</th>
<th>L</th>
<th>B</th>
<th>O</th>
<th>M</th>
<th>Q</th>
<th>U</th>
<th>D</th>
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<tbody>
<tr>
<td>H</td>
<td>F</td>
<td>C</td>
<td>A</td>
<td>K</td>
<td>V</td>
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Reteach

Dividing Integers

You can use these rules to divide integers.

If the signs of the integers are the same, the quotient is positive.

If the signs of the integers are different, the quotient is negative.

\[-30 \div (-6) = 5 \quad 16 \div 8 = 2\]

\[-21 \div 7 = -3 \quad 36 \div (-9) = -4\]

Divide. Multiply to check division.

1. \(14 \div (-2) = \underline{？}\)
2. \(8 \div 2 = \underline{？}\)
3. \(27 \div (-3) = \underline{？}\)

4. \(-15 \div (-3) = \underline{？}\)
5. \(24 \div 8 = \underline{？}\)
6. \(-96 \div (-12) = \underline{？}\)

7. \(40 \div 10 = \underline{？}\)
8. \(-8 \div 2 = \underline{？}\)
9. \(-6 \div (-3) = \underline{？}\)

10. \(36 \div (-6) = \underline{？}\)
11. \(-9 \div (-3) = \underline{？}\)
12. \(-6 \div (-2) = \underline{？}\)

13. \(-60 \div (-20) = \underline{？}\)
14. \(-20 \div 4 = \underline{？}\)
15. \(40 \div (-8) = \underline{？}\)

16. \(32 \div (-16) = \underline{？}\)
17. \(-14 \div 7 = \underline{？}\)
18. \(-36 \div 4 = \underline{？}\)

19. \(\frac{20}{-4} = \underline{？}\)
20. \(\frac{16}{4} = \underline{？}\)
21. \(\frac{-32}{-8} = \underline{？}\)

22. \(\frac{-12}{3} = \underline{？}\)
23. \(\frac{10}{2} = \underline{？}\)
24. \(\frac{-15}{-5} = \underline{？}\)

25. \(\frac{-72}{9} = \underline{？}\)
26. \(\frac{-9}{-3} = \underline{？}\)
27. \(\frac{96}{-8} = \underline{？}\)

28. \(9\sqrt{36} = \underline{？}\)
29. \(6\sqrt{-54} = \underline{？}\)
30. \(-8\sqrt{32} = \underline{？}\)

31. \(11\sqrt{33} = \underline{？}\)
32. \(-2\sqrt{-8} = \underline{？}\)
33. \(-5\sqrt{25} = \underline{？}\)

34. \(4\sqrt{-20} = \underline{？}\)
35. \(3\sqrt{21} = \underline{？}\)
36. \(-60\sqrt{-120} = \underline{？}\)
Divide.

1. \(-24 \div 8 = \) 
2. \(-30 \div (-10) = \) 
3. \(-40 \div (-4) = \)

4. \(-10 \div 2 = \) 
5. \(-81 \div 9 = \) 
6. \(63 \div (-7) = \)

7. \(-48 \div (-6) = \) 
8. \(-56 \div (-8) = \) 
9. \(-21 \div 7 = \)

10. \(-13 \div 1 = \) 
11. \(18 \div (-6) = \) 
12. \(4 \div (-2) = \)

13. \(39 \div 3 = \) 
14. \(-50 \div (-25) = \) 
15. \(-20 \div (-5) = \)

Find the value of each expression.

16. \([18 \div (-2)] \times 8 = \) 
17. \([28 \div (-4)] \times 6 = \)

18. \(36 \div (-3 \times 3) = \) 
19. \(13 + [18 \div (-6)] = \)

20. \([10 \times (-4)] \div 5 = \) 
21. \(16 - [25 \div (-5)] = \)

Solve.

22. Which has the greatest quotient:
   \(25 \div (-5); -25 \div (-5); -25 \div 5;\) or \(25 \div 5?\) Explain.

   ________________________________

23. Over 3 years the number of book club members declined by 27. If the decline in numbers was the same each year, which integer represents the number of members lost each year?

   ________________________________
Homework Practice

Dividing Integers

Divide.

1. \(-10 \div 2\)  
2. \(42 \div 7\)  
3. \(36 \div (-6)\)

4. \(-18 \div 2\)  
5. \(45 \div 9\)  
6. \(63 \div (-7)\)

7. \(-15 \div 3\)  
8. \(49 \div 7\)  
9. \(-72 \div (-8)\)

10. \(-24 \div 2\)  
11. \(40 \div 8\)  
12. \(-50 \div (-5)\)

ALGEBRA

13. Find the value of \(c \div d\) if \(c = -30\) and \(d = 3\).

14. What value of \(m\) makes \(27 \div m = -9\) true?

Solve.

15. Karen lost a total of 10 points over the last 2 rounds of a game. If she lost the same number of points each round, what integer represents her change in score each round?

Solve. Use the work backward strategy. (Lesson 7–5)

16. A number is multiplied by 10, and then \(-15\) is added to the product. The result is 35. What is the number?
Problem-Solving Practice

Dividing Integers

Solve.

1. A football team was penalized a total of 30 yards in 3 plays. If the team was penalized an equal number of yards on each play, what integer represents the change in yardage for each penalty?

2. Over 6 years, the number of registered voters in Sequoia Heights declined by 2,400. If the decline in numbers was the same each year, what integer represents the change per year?

3. For the last 4 years, the average temperature of Clear Lake has dropped from 80°F to 72°F. If the decline in temperature was the same each year, what integer represents the change per year?

4. Carlos lost a total of 16 points over the last 2 rounds of a game. If he lost the same number of points each round, what integer represents the change in his score each round?

5. A plane starts above the clouds and then travels 50 feet toward the earth in 10 seconds. If the plane traveled an equal distance each second, what integer gives the change in altitude per second?
Enrich

Multiply and Divide Integers

Evaluate each numerical expression. Put the letters above the answers at the bottom of the page to answer the questions.

Y. $-52 \div 4 = \underline{\hspace{2cm}}$

S. $-24 \div (-12) = \underline{\hspace{2cm}}$

N. $(-3 + (-9)) \div 4 = \underline{\hspace{2cm}}$

R. $(8 \times (-8)) \div (4 \times (-4)) = \underline{\hspace{2cm}}$

K. $(21 - (-7)) \div 4 = \underline{\hspace{2cm}}$

T. $15 - (-25) \div 5 = \underline{\hspace{2cm}}$

A. $-49 \div 7 - (-3) = \underline{\hspace{2cm}}$

N. $(2 + 50) \div (-2) = \underline{\hspace{2cm}}$

A. $-72 \div (-9) = \underline{\hspace{2cm}}$

L. $-100 \div (-20) = \underline{\hspace{2cm}}$

V. $6 + (-15) \div 5 = \underline{\hspace{2cm}}$

L. $30 \div (-5) + 40 \div (-8) = \underline{\hspace{2cm}}$

I. $(-6 \times (-8)) \div (2 - 6) = \underline{\hspace{2cm}}$

U. $-45 \div 5 + 24 \div (-3) = \underline{\hspace{2cm}}$

H. $(12 \times (-6)) \div (-4 - 4) = \underline{\hspace{2cm}}$

Who was the first woman to walk in space?
Choose the Best Strategy

The high tide at Sunshine Beach on Monday was 7 feet. The low tide on Monday was –3 feet. Molly claimed that the difference in the heights of the tides was 4 feet. Use logical reasoning to find out if Molly’s claim is correct.

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<th>Understand</th>
<th>What do you know?</th>
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<tr>
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<td>High tide was ______ and low tide was ______.</td>
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<td>What do you need to find out?</td>
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<td>__________________________</td>
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<table>
<thead>
<tr>
<th>Step 2</th>
<th>Plan</th>
<th>Which operation should you use to find the difference in the heights of the tides?</th>
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<tr>
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<td></td>
<td></td>
<td>What is Molly’s claim?</td>
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<td>__________________________</td>
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<tr>
<th>Step 3</th>
<th>Solve</th>
<th>Complete.</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>The difference between a positive integer and a negative integer is always __________________________ the positive integer.</td>
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<td></td>
<td>Evaluate Molly’s claim. Explain.</td>
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<tr>
<th>Step 4</th>
<th>Check</th>
<th>To check, find the difference.</th>
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<td>__________________________</td>
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<td></td>
<td></td>
<td>The difference was ______.</td>
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</table>

Use any strategy shown below to solve.

- Use logical reasoning
- Work backward
- Guess and check

1. On Thursday, the high tide reached 4 feet. The low tide on Thursday was 7 feet lower than high tide. Glen calculated that the low tide was 3 feet. Is his calculation correct? Explain.

2. At 2 A.M., the temperature was –3°F. By 6 A.M., the temperature had risen 4°F. Carmen calculates the temperature at 6 A.M. is 1°F. Is her calculation correct? Explain.
3. Your parents have given you twice as many dollars as your age on each birthday since your fifth birthday. If you are 10 years old, how much money have you been given over the years?

4. Find the missing term in the pattern below.

   ..... _______, 2, 5, 8, 11, 14

5. Sarah needs to arrive at work at 7:45 A.M. It takes her 12 minutes to drive to her office, 15 minutes to make and eat breakfast, and 37 minutes to get ready. What time does she need to set her alarm for to get to work on time?

6. On Wednesday, 72 cookbooks were sold at a book sale. This is 9 more than one half the amount sold on Tuesday. How many cookbooks were sold on Tuesday?

7. Robert has 39 model cars and his brother, Frank, has 56 model cars. How many more model cars does Robert need to have the same number as his brother?

8. The local pet store made a profit if $300 in March, but only made a profit of $150 in April. How much more did the pet store make in March?
Choose the Best Strategy

Use any strategy shown below to solve.

- Use logical reasoning
- Work backward
- Guess and check

1. At 3 A.M., the tide was $-4$ feet. By 9 A.M., the tide had risen 6 feet. Andre calculates that the tide reached 10 feet at 9 A.M. Is his calculation correct? Explain.

2. A scuba diver descended 8 feet below the surface of the water. Then he descended an additional 12 feet. He then ascends 3 feet. Write an integer to show his distance from the surface.

3. A croquet ball has a mass of 460 grams. Together, the mass of a golf ball and a croquet ball is the same as the mass of 11 golf balls. What is the mass of one golf ball?

4. The temperature recorded at 5 A.M. was $25^\circ F$. The temperature increased by $2^\circ F$ for every hour for the next four hours. What was the temperature at the end of the four hours?

Choose the correct answer.

At Clearview Beach, the lowest tide of the year was $-9$ feet. The highest tide for the year was 12 feet.

5. Which of the following is true?
   - A. The range in the highest and lowest tides for the year is 21 feet.
   - B. The tide changes by 3 feet from high tide to low tide.
   - C. The highest tide for the year reached 21 feet.
   - D. The lowest tide for the year reached $-12$ feet.

6. When checking if an answer is reasonable,
   - F. rework the problem at least three times.
   - G. compare it with known facts.
   - H. guess whether or not the answer looks correct.
   - J. use multiplication to solve.
Use any strategy shown below to solve.

- Logical reasoning
- Work backward
- Guess and check

1. Find the missing term in the pattern below.
   \[ \ldots, \quad \_, -6, -3, 0, 3, 6 \]

2. Yolanda needs to be home at 4:00 P.M. It takes her 20 minutes to walk home, 20 minutes to say goodbye to her friends, and 10 minutes to organize her books and notebooks at school. What is the latest time she should start getting ready to come home?

**Spiral Review**

**Divide. (Lesson 7-6)**

1. \( 12 \div 2 \) ________  
2. \( 60 \div (-6) \) ________  
3. \( 24 \div (-6) \) ________  
4. \( -9 \div 3 \) ________  
5. \( 81 \div 9 \) ________  
6. \( 48 \div (-6) \) ________  
7. \( -35 \div 5 \) ________  
8. \( 64 \div 8 \) ________  
9. \( -21 \div (-7) \) ________

**ALGEBRA**

10. Find the value of \( c \div d \) if \( c = -32 \) and \( d = 4 \).

11. What value of \( m \) makes \( -9 \div m = -9 \) true?
A **magic square** is a square of numbers in which each row, column, and diagonal has the same sum.

Use counters to find if each is a magic square. If so, give the magic sum.

**1.**

\[
\begin{array}{ccc}
-4 & 10 & 0 \\
-6 & 2 & -2 \\
4 & 6 & -8 \\
\end{array}
\]

Magic Square: Yes or No? _____

**2.**

\[
\begin{array}{ccc}
-7 & -12 & -11 \\
-14 & -10 & -6 \\
-9 & -8 & -13 \\
\end{array}
\]

Magic Square: Yes or No? _____

Use counters to complete these magic squares.

**3.**

\[
\begin{array}{ccc}
7 & -7 & 4 \\
2 & 1 & -1 \\
-2 & -3 \\
-5 & 6 & -8 \\
\end{array}
\]

Sum: ____

Sum of the four middle squares: ____

Sum of the four corners: ____

**4.**

\[
\begin{array}{ccc}
-7 & -8 & 3 \\
-5 & 0 & 1 \\
-1 & -3 & 2 \\
-6 & 5 & 4 & -9 \\
\end{array}
\]

Sum: ____

Sum of the four middle squares: ____

Sum of the four corners: ____
Reteach

The Coordinate Plane

This is a coordinate plane. The horizontal number line is the x-axis, and the vertical number line is the y-axis. The point where the axes intersect is the origin. The two axes divide the plane into four quadrants, numbered I, II, III, IV.

Point P shown on the graph is named by ordered pair (−4, 3). To graph, or plot, point P, begin at the origin and count 4 spaces to the left. Then count up 3 spaces.

The ordered pair gives the coordinates of point P.

Use the graph above. Write the ordered pair that names each point.

Skills Practice
The Coordinate Plane

Write the ordered pair that names each point.

1. A _____
2. B _____
3. C _____
4. D _____
5. E _____
6. F _____

Use the coordinate plane at the right. Identify the point for each ordered pair.

7. (3, 0) _____
8. (–3, 0) _____
9. (–2, –4) _____
10. (2, –7) _____
11. (1, 4) _____
12. (–2, 5) _____

Solve.

13. Ann uses the equation \( y = x + 5 \) to track a flock of migratory blue birds. Will the birds pass through the point \((-1, -4)\)? Explain.

14. An ant was located at the point (2, 3). It crawled down vertically 4 units, and turned to its right and crawled horizontally for 7 units. At what coordinates is the ant now?
Homework Practice
The Coordinate Plane

Use the coordinate plane at the right. Identify the point for each ordered pair.

1. (3, 4) _____ 2. (−4, 3) _____

3. (−4, −4) _____ 4. (−2, 2) _____

Use the coordinate plane above. Write the ordered pair that names each point. Then, identify the quadrant where each point is located.

5. T _____ 6. S _____

7. U _____ 8. B _____

Graph and label each point on the coordinate plane.

9. N (2, 1) 10. M (−3, −2)

11. P (−3, 2) 12. F (2, −2)

Spiral Review

Use any strategy shown below to solve. (Lesson 7–7)

The four-step plan
Logical reasoning
Work backward
Guess and check

13. Sean needs to be at practice at 10:00 A.M. every Saturday. It takes him 30 minutes to walk to practice, 30 minutes to get ready, and 10 minutes to organize his equipment. What is the latest time he should start getting ready for practice?
1. What are the coordinates of the pirate ship? In which quadrant is it located?

2. What is located at the ordered pair \((-2.5, -3.5)\)?

3. Begin at the lookout tower. Travel east 7 units and north 4 units. Where are you?

4. Which is the farthest south: the buried treasure, the mountain, or the parrot?
Latitude lines are parallel to the equator and run from 90°N (the North Pole) to 90°S (the South Pole). Longitude lines are measured east and west of the prime meridian, the 0° longitude line which runs through Greenwich, England. Point A in the figure has coordinates (15°S, 45°W).

Write the coordinates, giving the north-south coordinates first.

1. B ______________
2. C ______________
3. D ______________
4. E ______________
5. F ______________
6. South Pole ______________

Graph each point on the coordinate grid map. Write the letter beside the point.

7. G (75°S, 75°E)  
8. H (25°N, 45°E)  
9. I (60°S, 90°W)  
10. J (0°, 30°E)  
11. K (60°N, 75°E)  
12. L (45°N, 60°W)  
13. How many degrees of latitude separate Halifax, Nova Scotia (45°N, 65°W), and Cordoba, Argentina (32°S, 65°W)?

14. How many degrees of longitude separate Baku (41°N, 50°E), and New Haven, CT (41°N, 73°W)?

15. One degree of longitude at the equator is about 69.2 miles. How far is it from Quito, Equador (0°, 79°W) to Kampala, Uganda (0°, 32°10′E), to the nearest 10 miles?

16. Macapa, Brazil (0°, 51°W), is located almost exactly due west of Libreville, Gabon. The distance between the cities is about 4,150 miles. Give the latitude and longitude of Libreville, to the nearest degree.
You can use subtraction to solve addition equations.

Solve: \( c + 25 = 39 \)

To find the value of \( c \),

\[
\begin{align*}
\text{subtract 25 from each side of the equation.} & \quad \ \ \ c + 25 = 39 \\
-25 & = -25 \\
\hline \\
\text{c} & = 14
\end{align*}
\]

Check your answer by substituting 14 for \( c \) in the original equation.

\[
\begin{align*}
14 + 25 & = 39 \\
39 & = 39 \quad \leftarrow \text{It checks.}
\end{align*}
\]

Solve each equation. Check your solution.

1. \( n + 36 = 75 \)

\[
\begin{align*}
n & = \underline{39} \\
\end{align*}
\]

2. \( b + 4.6 = 15.9 \)

\[
\begin{align*}
b & = \underline{11.3} \\
\end{align*}
\]

3. \( w + \frac{1}{8} = \frac{7}{8} \)

\[
\begin{align*}
w & = \underline{1} \\
\end{align*}
\]

4. \( p + 7 = 83 \)

\[
\begin{align*}
p & = \underline{76} \\
\end{align*}
\]

5. \( c + 46 = 213 \)

\[
\begin{align*}
c & = \underline{167} \\
\end{align*}
\]

6. \( s + 8 = 4 \)

\[
\begin{align*}
s & = \underline{-4} \\
\end{align*}
\]

7. \( a + 9 = 3 \)

\[
\begin{align*}
a & = \underline{-6} \\
\end{align*}
\]

8. \( z + 10 = -4 \)

\[
\begin{align*}
z & = \underline{-14} \\
\end{align*}
\]

9. \( y + 1 = -8 \)

\[
\begin{align*}
y & = \underline{-9} \\
\end{align*}
\]

10. \( -5 = g + 8 \)

\[
\begin{align*}
g & = \underline{-13} \\
\end{align*}
\]

11. \( -4 = z + 1 \)

\[
\begin{align*}
z & = \underline{-5} \\
\end{align*}
\]

12. \( 9 = m + 4 \)

\[
\begin{align*}
m & = \underline{5} \\
\end{align*}
\]
7–9

Skills Practice
Solving Addition Equations

Solve each equation. Check your solution.

1. \( a + 8 = 23 \)
2. \( s + 9 = 26 \)
3. \( f + 36 = 58 \)
4. \( z + 6 = -4 \)
5. \( v + 14 = 162 \)
6. \( h + 2.7 = 3.8 \)
7. \( k + 20 = -10 \)
8. \( t + 30 = 94 \)
9. \( r + \frac{3}{4} = 17 \)
10. \(-9 = d + 1\)
11. \( s + 14.9 = 31.6 \)
12. \( 10 = c + 21 \)
13. \( 4.5 = e + 0.4 \)
14. \( z + \frac{1}{2} = \frac{6}{4} \)
15. \(-52 = g + 30 \)
16. \( c + 200 = 473 \)
17. \( w + 35 = 5 \)
18. \( p + \frac{2}{3} = 7 \)

Solve.

19. The high temperature one day in Washington, D.C., was 40°F. That was 14°F greater than the low temperature. Write an addition equation to describe the situation. Use \( t \) to represent the low temperature. Then solve the equation.

20. One year Chicago, IL, received 39.2 inches of snow. That was 9.8 inches more than the previous year. Write an addition equation to describe the situation. Solve it to find last year’s snowfall in inches, \( s \).
Solving Addition Equations

Solve each equation. Check your solution.

1. \( y + 4 = 8 \)  
2. \( 10 = 5 + d \)  
3. \( x + 2 = -12 \)

4. \( y + 7 = -16 \)  
5. \( x + 0 = -1 \)  
6. \( y + 3 = -8 \)

7. \( y + 9 = 18 \)  
8. \( 0 = 5 + d \)  
9. \( x + \frac{3}{4} = 3 \frac{1}{2} \)

10. \( 5 \frac{1}{2} = 5 + d \)  
11. \( x + 6 = -12 \)  
12. \( -10.1 = 7 + d \)

13. \( y + 6.9 = 2.6 \)  
14. \( -3.9 = 2.3 + d \)  
15. \( x + 1.5 = 3 \)

Solve.

16. Andrew weighs 94 pounds with his new boots on. Without them, Andrew weighs 92 pounds. Write and solve an addition equation to find the weight of the boots.

Spiral Review

Use the coordinate plane. Identify the point for each ordered pair. (Lesson 7–8)

17. \((3, 4)\)  
18. \((-5, 3)\)

19. \((-5, -4)\)  
20. \((-2, -2)\)
Write an equation to solve.

1. Eugene’s football team scored 17 points in a football game, 6 of which Eugene scored. How many points did the rest of the team score?

2. Dottie read her book on Wednesday and Thursday. If she read 27 pages on Wednesday and read 64 pages in all, how many pages did she read on Thursday?

Solve.

3. Margarita had to measure butter for a recipe. She did not want to measure it directly in a cup because some butter would stick to the side of it. She put $1\frac{1}{2}$ cups cold water into a measuring cup and added butter until the level of the water read 2 cups. How much butter did she measure?

4. Silas rode his bicycle 2.5 blocks to his friend’s house. From there, the two boys rode the rest of the way to school. If it is 8.7 blocks from Silas’s house to the school, how far is it from his friend’s house to the school?

5. Flora had saved a total of $24.85. She went to a department store and bought a pair of gloves and a hat that matched her winter coat. If the gloves cost $6.85 and she had $10.45 left over, what did the hat cost?

6. Diane’s parents bought three boxes of tiles to replace the old tiles on their kitchen floor. Each tile is one square foot, and there are 30 tiles to a box. The kitchen floor is 78 square feet. How many tiles will they have left over?
Explore Addition Equations

Solve each equation. Then write each letter above its number at the bottom of the page.

1. $15 + B = 23$ 
2. $S + 9 = 18$
3. $H + 8 = 24$ 
4. $S + 3 = 13$
5. $L + 6 = 18$ 
6. $E + 7 = 13$
7. $P + 9 = 27$ 
8. $T + 17 = 32$
9. $S + 26 = 40$ 
10. $N + 57 = 128$
11. $16 + O = 27$ 
12. $E + 516 = 741$
13. $H + 13 = 20$ 
14. $I + 424 = 623$
15. $15 + O = 34$ 
16. $39 + Y = 73$
17. $E + 249 = 355$ 
18. $38 + T = 91$
19. $T + 55 = 72$ 
20. $49 + Y = 106$
21. $I + 804 = 976$ 
22. $125 = C + 112$

What words of advice could you give to Pinocchio?
Reteach

Solving Subtraction Equations

You can use addition to solve subtraction equations.

Solve: \( f - 2 = 13 \)

To find the value of \( f \), add 2 to both sides of the equation.

\[
\begin{align*}
  f - 2 & = 13 \\
  + 2 & = + 2 \\
  f & = 15
\end{align*}
\]

Check your answer by substituting 15 for \( f \) in the original equation.

\[
\begin{align*}
  f - 2 & = 13 \\
  15 - 2 & = 13 \\
  13 & = 13 \leftarrow \text{It checks.}
\end{align*}
\]

Solve each equation. Check your solution.

1. \( a - 7 = 10 \) ______
2. \( j - 3 = 11 \) ______
3. \( l - 9 = 1 \) ______
4. \( p - 11 = -5 \) ______
5. \( b - 9 = 6 \) ______
6. \( g - 10 = -4 \) ______
7. \( m - 7 = 12 \) ______
8. \( i - 12 = 2 \) ______
9. \( d - 2 = 8 \) ______
10. \( k - 3 = 6 \) ______
11. \( z - 2 = -11 \) ______
12. \( r - 7 = -2 \) ______
13. \( n - 4 = -11 \) ______
14. \( y - 9 = 1 \) ______
15. \( f - 2 = 1 \) ______
16. \( q - 8 = 3 \) ______
17. \( c - 15 = 5 \) ______
18. \( h - 4 = -3 \) ______
Skills Practice
Solving Subtraction Equations

Solve each equation. Check your solution.

1. \( n - 4 = 9 \) _____
2. \( d - 3 = 6 \) _____
3. \( b - 7 = 3 \) _____
4. \( r - 4 = 4 \) _____
5. \( y - 8 = 14 \) _____
6. \( s - 4 = -2 \) _____
7. \( 9 = d - 6 \) _____
8. \( m - 7 = 9 \) _____
9. \( 3 = w - 7 \) _____
10. \( 4 = z - 6 \) _____
11. \( f - 3 = -12 \) _____
12. \(-2 = t - 1 \) _____
13. \( a - 10 = 4 \) _____
14. \( v - 9 = 2 \) _____
15. \( 5 = i - 3 \) _____
16. \( a - 7 = 2 \) _____
17. \( v - 10 = -2 \) _____
18. \( -3 = n - 1 \) _____
19. \( 7 = i - 6 \) _____
20. \( -7 = r - 4 \) _____

Solve.

21. Leah started with \( d \) dollars. After Leah spent $19, she had $13 left. Write a subtraction equation to represent this situation. Then solve the equation to find the amount of money Leah started with.

22. A chapter has 45 pages. Larry has read \( n \) pages, and has 8 pages left. Write a subtraction equation to represent this situation. Then solve the equation to find the number of pages Larry has left to read.
Solve each equation. Check your solution.

1. \(y - 4 = 2\)  
2. \(d - 5 = -5\)  
3. \(d - 11 = 4\)

4. \(x - 8 = -3\)  
5. \(y - 4 = -7\)  
6. \(d - 13\frac{1}{2} = -8\)

7. \(-3 = d - 9\)  
8. \(x - 6 = -1\)  
9. \(y - 1\frac{1}{2} = 2\)

10. \(d - 7.5 = -10.8\)  
11. \(x - 1.1 = 1.9\)  
12. \(x - 4 = -3.5\)

Solve.

13. The difference between record high and record low temperatures for August in New York City is 40°F. The record low is 60°F. Write and solve an equation to find the record high temperature of summer in New York City.

Solve each equation. Check your solution. (Lesson 7–9)

14. \(y + 9 = 18\)  
15. \(-2.4 = 1.1 + d\)  
16. \(t + \frac{1}{2} = 9\)

17. \(-12 = -6 + d\)  
18. \(x + 10 = -12\)  
19. \(m - 3 = 0\)

20. \(s + 1.5 = 3\)  
21. \(25 = 5 + d\)  
22. \(x + 7 = -14\)

Solve.

23. Usually, running burns 300 more calories per hour than swimming does. If Emily burns 400 calories per hour running, write and solve an addition equation to find how many calories Emily will burn swimming.
Problem-Solving Practice
Solving Subtraction Equations

Write an equation. Then solve.

1. Doug had 250 liters of soup to serve in the cafeteria. After lunch, 27 liters were left over. How much soup was served?

2. Alisa and other students write articles for the school newspaper. The next issue of the newspaper will contain 87 articles. Alisa finished writing all of her articles, and now there are 75 articles left for the other students to write. How many articles did Alisa write?

3. Ted has a choice of two summer camps, one of which is 26.7 miles from home and one that is 98.3 miles from home. How much farther is the second camp from Ted’s home?

4. Jaida and her sister shared a mushroom and pepperoni pizza. Jaida ate $\frac{1}{2}$ of the pizza. After her sister had some, there was $\frac{1}{6}$ of the pizza left. How much did her sister eat?

5. Rosanne wanted to compare the amount of electricity she used in the summer to the amount she used in the winter. The reading on her electric meter at the first of January was 1587 kWh (kilowatt-hour) and the reading at the first of February was 1746 kWh. How many kWh did she use in January? ____________ kWh

The following summer, the reading at the first of July was 2047 kWh, and the reading at the first of August was 2238 kWh. How many kWh did she use in July? ____________ kWh

How many more kWh did she use in July than in January? ____________ kWh

6. Martin has birdhouses outside his home. When he checked them two weeks ago, three of them had bluebirds, four of them had sparrows, and the rest of them had martins. When he checked them last week, half of the houses that had martins had been taken over by blue jays. If he has 11 birdhouses, how many of them contained blue jays?
**Enrich**

**Addition and Subtraction Equations**

Play this game with a partner. You will need counters, scissors, and a paper bag.

- Cut out the equations at the bottom of the page and put them in the paper bag.

- Draw an equation from the bag. Calculate the answer. If the answer is a whole number, move forward that many spaces. If the answer is a fraction or decimal, go back to START.

- The winner is the first player to reach 50 points. You may need to go around the game board several times before there is a winner.

<table>
<thead>
<tr>
<th>Subtract 10 from your score.</th>
<th>Go ahead 3 spaces.</th>
<th>Lose a turn.</th>
<th>Add your partner’s score to yours.</th>
<th>You earn 9 points.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add 6 to everyone’s score.</td>
<td></td>
<td></td>
<td></td>
<td>You earn 7 points.</td>
</tr>
<tr>
<td>You earn 7 points.</td>
<td></td>
<td></td>
<td></td>
<td>Take another turn.</td>
</tr>
<tr>
<td>Take another turn.</td>
<td></td>
<td></td>
<td></td>
<td>Add 2 to your score.</td>
</tr>
</tbody>
</table>

**The Equation Game**

- Start

<table>
<thead>
<tr>
<th>$x + 19 = 24$</th>
<th>$y - 5 = 1$</th>
<th>$b + \frac{1}{3} = 4\frac{1}{3}$</th>
<th>$c + 5.3 = 7.3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a + 14 = 18$</td>
<td>$n - 1 = 3$</td>
<td>$w - 2.8 = 0.2$</td>
<td>$d - 0 = 5\frac{3}{4}$</td>
</tr>
<tr>
<td>$m + 7.5 = 8.5$</td>
<td>$k - 3 = 3$</td>
<td>$z + 11 = 11$</td>
<td>$q - 2.9 = 1.1$</td>
</tr>
<tr>
<td>$p - 2 = 5$</td>
<td>$d + \frac{5}{6} = \frac{5}{6}$</td>
<td>$j + 1.8 = 2.2$</td>
<td>$v + 1 = 7$</td>
</tr>
<tr>
<td>$f - 2 = 1$</td>
<td>$h + 4.6 = 6.4$</td>
<td>$r - 5 = 0$</td>
<td>$t - 1.3 = 0.7$</td>
</tr>
</tbody>
</table>
You can use division to solve multiplication equations.

Solve: $12s = 240$

To find the value of $s$,
divide both sides of the equation by 12.

$\frac{12s}{12} = \frac{240}{12}$

$s = 20$

Check your answer by substituting 20 for $s$ in the original equation.

$12 \times 20 = 240$

$240 = 240 \leftarrow$ It checks.

Solve each equation. Check your solution.

1. $8d = 96$
   $d = _____$

2. $2.5m = 75$
   $m = _____$

3. $\frac{1}{2}k = 3.2$
   $k = _____$

4. $0.7y = 42$
   $y = _____$

5. $15n = 60$
   $n = _____$

6. $7w = 56$
   $w = _____$

7. $\frac{3}{4}a = \frac{1}{2}$
   $a = _____$

8. $9v = 72$
   $v = _____$

9. $30b = 600$
   $b = _____$

10. $2a = 26$
    $a = _____$

11. $5b = -25$
    $b = _____$

12. $-3z = 51$
    $z = _____$

13. $-2x = 10$
    $x = _____$

14. $7y = 49$
    $y = _____$

15. $-3a = -15$
    $a = _____$

16. $3b = 45$
    $b = _____$

17. $8x = -64$
    $x = _____$

18. $-9z = 27$
    $z = _____$
Skills Practice

Solving Multiplication Equations

Solve each equation. Check your solution.

1. \(7w = 28\) 
2. \(6q = 108\)

3. \(20d = 180\) 
4. \(6a = 12\)

5. \(4e = 276\) 
6. \(15y = 48\)

7. \(8k = 40\) 
8. \(0.4p = 16\)

9. \(3j = 39\) 
10. \(12s = 60\)

11. \(30h = 15\) 
12. \(8w = 64\)

13. \(-3y = 12\) 
14. \(2.4c = 120\)

15. \(10x = -20\) 
16. \(7s = 21\)

17. \(4x = 12\) 
18. \(32f = 6.4\)

19. \(0.6t = 60\) 
20. \(-4w = 24\)

Solve.

21. The Martinez family paid $37.50 for 5 movie passes. Write a multiplication equation to describe the situation. Solve it to find the cost in dollars, \(c\), of each movie pass.

22. Three friends each bought a gift. Each of the presents cost the same amount. All together, they paid $15. Write a multiplication equation to describe the situation.
Homework Practice
Solving Multiplication Equations

Solve each equation. Check your solution.

1. \(6b = 24\) _____
2. \(-8m = -32\) _____
3. \(49 = 7x\) _____

4. \(2y = 10\) _____
5. \(-1t = -12\) _____
6. \(63 = 7x\) _____

7. \(8a = 24\) _____
8. \(-2s = -22\) _____
9. \(54 = 6y\) _____

Solve.

10. Maria painted flowers on 10 plates and earned $50. Write and solve an equation to find out how much she earned for each plate.

Spiral Review

Solve each equation. Check your solution. (Lesson 7–10)

11. \(y - 4 = 2\) _____
12. \(-4 = -11 - d\) _____
13. \(-4.5 - x = -4\) _____

14. \(x - 8 = -3\) _____
15. \(y - 4 = -7\) _____
16. \(8 \frac{1}{2} = 13 \frac{1}{2} - d\) _____

17. \(-5 = d - 10\) _____
18. \(t - 9 \frac{1}{2} = -4 \frac{1}{2}\) _____
19. \(-1.1 = -10.5 - d\) _____

Solve.

20. Joe is 3 inches shorter than his brother Jack. Jack is 60 inches tall. Write and solve an equation to find out how tall Joe is.
Solving Multiplication Equations

Write an equation. Then solve.

1. Samantha has 84 tomato plants in 12 rows. How many tomato plants are in each row?

2. If Calah cuts 16 pizzas into 128 total slices, into how many slices will each pizza be cut?

3. Olivia raises 12 chickens on her farm. If she gathers 240 eggs in 2 weeks, how many eggs did each chicken lay if they each laid the same number of eggs?

4. Juan works a total of 5 hours at his after-school job. If he earns $35, how much does he earn per hour?

5. Sophia has a large family. There are 48 people sitting at 6 tables. When they all get together for a holiday dinner, how many people are sitting at each table if there are the same number of people at each table?

6. Jacob likes to go on nature walks. On one of his walks, he noticed 8 different types of insects. His walk covered only 1 acre. If he walked and saw 32 insects, how many acres would he have walked?
The Vice President takes over if the President cannot fulfill the term of office. But who takes over should the Vice President leave office before completing the term of office?

To find the answer, solve each equation. Write the capital letter that is before the equation on the line above the answer at the bottom of the page.

**H** \[ 8n = 40 \]  \( n = \)  
**S** \[ 3c = 36 \]  \( c = \)  

**R** \[ \frac{y}{3} = 9 \]  \( y = \)  
**P** \[ 10k = 140 \]  \( k = \)  

**O** \[ 3d = 12.9 \]  \( d = \)  
**U** \[ \frac{y}{8} = 9 \]  \( y = \)  

**V** \[ 9r = 27 \]  \( r = \)  
**N** \[ 2.3t = 0.46 \]  \( t = \)  

**T** \[ 4t = 38 \]  \( t = \)  
**I** \[ 87t = 87 \]  \( t = \)  

**E** \[ 0.6n = 36 \]  \( n = \)  
**F** \[ \frac{a}{5} = 11 \]  \( a = \)  

**K** \[ 1\frac{1}{3}a = 12 \]  \( a = \)  
**A** \[ 13d = 16.9 \]  \( d = \)
## Individual Progress Checklist

<table>
<thead>
<tr>
<th>B</th>
<th>D</th>
<th>M</th>
<th>Goal</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>compare and order integers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>add, subtract, multiply, and divide integers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>locate and graph ordered pairs on a coordinate plane</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>solve and write addition, subtraction, and multiplication equations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>solve problems by working backward</td>
<td></td>
</tr>
</tbody>
</table>

## Notes

_________________________________________________________________

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_________________________________________________________________
Chapter Diagnostic Assessment

**Add.**

1. \(5 + 7 = \)  
2. \(6 + 4 = \)  
3. \(9 + 3 = \)  
4. Myndi ate 8 peanuts. Jason ate 12 peanuts. How many peanuts did they eat altogether?

**Subtract.**

5. \(15 - 2 = \)  
6. \(9 - 5 = \)  
7. \(14 - 10 = \)  
8. During her 5-day science camp, Salimah spent 2 days doing experiments in the science lab. How many days did she not spend doing experiments in the science lab?

**Multiply.**

9. \(8 \times 3 = \)  
10. \(5 \times 9 = \)  
11. \(3 \times 2 = \)  
12. Sarah read 2 hours a day for 7 days. How many hours did she read in all?

**Divide.**

13. \(24 \div 6 = \)  
14. \(36 \div 6 = \)  
15. \(81 \div 9 = \)
Chapter Pretest

Solve.

1. \(-4 + (-5) = \)
2. \(2 - (-7) = \)
3. \((-5) \times 15 = \)
4. \(-9 \times (-5) = \)
5. \((-14) \div (-2) = \)
6. \(40 \div (-4) = \)

Order from least to greatest.

7. \(-4, 2, -7, 3 \)
8. \$2.00, $0.25, -$0.40, -$0.15

Find the value of \(p\).

9. \(56 = -8p \)
10. \(-13 = p - 2 \)
11. \(p + 19 = 1 \)
12. \(p - 7 = -12 \)
13. \(3p = 39 \)

Write the ordered pair that names each point. Then identify the quadrant where each point is located.

14. \(A\)
15. \(B\)
16. \(C\)
17. \(D\)
Add or subtract.

1. \(12 + (-5)\)
2. \(-8 + (-12)\)
3. \(9 + (-3)\)
4. \(-10 - 6\)
5. \(10 - 11\)

Replace each \(\square\) with < or > to make a true sentence.

6. \(-85 \square 20\)
7. \(21 \square 12\)

Order each set of integers from least to greatest.

8. \(3, 35, 20, 0, 1\)
9. \(-67, 100, -40, 14, 20, -60\)

Solve.

10. The temperature outside is 0°F. If the temperature goes down 2°F, what will the temperature be?
Multiply or divide.

1. $8 \times (-7)$
2. $-6 \div (-3)$
3. $-2 \times (-11)$
4. $-100 \div 10$
5. $-8 \times 8$
6. $45 \div (-5)$

ALGEBRA

7. Evaluate $a(-b)(-3)$ if $a = 9$ and $b = 2$.
8. Find the value of $m(n - 11)$ if $m = -4$ and $n = -5$.

Solve. Use the work backward strategy.

9. Todd receives $25 every month for his allowance. He owes his brother $10. After Todd pays back his brother, how much of his allowance will he have left?
10. Ali goes shopping for school supplies. She buys 5 pencils that cost $0.10 each. She also buys 1 folder for $0.89 and 1 binder of $1.11. Ali pays the cashier and receives $0.50 as change. How much money did Ali pay the cashier?
Solve each equation.

1. \( 8 + x = 27 \)
2. \( y - 9 = -2 \)
3. \( 7a = -42 \)
4. \( -11 + w = 16 \)
5. \( -9t = -72 \)
6. \( d - 4 = -7 \)
7. \( 5.8 + p = -13.1 \)

Use the coordinate plane for problems 8–10.

8. Which point is in Quadrant IV?
9. Which point is at \((-4, -1)\)?
10. What ordered pair names point \(P\)?
Evaluate each expression.

1. $5(-10)$
   - A. $-50$
   - B. $-15$
   - C. $15$
   - D. $50$

2. $-9 \div 9$
   - F. $-9$
   - G. $-1$
   - H. $1$
   - J. $9$

3. $-8 + 16$
   - A. $-8$
   - B. $-6$
   - C. $6$
   - D. $8$

4. $4 - (-2)$
   - F. $-6$
   - G. $-4$
   - H. $4$
   - J. $6$

5. $-5 - 18$
   - A. $-24$
   - B. $-23$
   - C. $23$
   - D. $24$

Replace each $\bigcirc$ with $<$ or $>$ to make a true sentence.

6. $-17 \bigcirc 1$
   - 6. __________

7. $-8 \bigcirc -9$
   - 7. __________

Solve.

8. Write two different number sentences with sums that are each $-6$.
   - 8. __________

9. The temperature at 7:00 A.M. is $3^\circ$C. By noon, the temperature has decreased by 4 degrees. At 6:00 P.M., the temperature has decreased by 5 more degrees. What is the temperature at 6:00 P.M.?
   - 9. __________

10. Myra is 3 years older than Jia. Jia is 7 years younger than Bobbi. Bobbi is twice as old as Sue. If Sue is 6 years old, how old is Myra?
   - 10. __________
Match each word to its definition. Write your answers on the lines provided.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. coefficient</td>
<td>A. A pair of counters that includes one positive counter and one negative counter.</td>
<td></td>
</tr>
<tr>
<td>2. inverse operations</td>
<td>B. Numbers that are the same distance from zero in opposite directions.</td>
<td></td>
</tr>
<tr>
<td>3. quadrants</td>
<td>C. A pair of numbers that are the coordinates of a point in a coordinate plane or grid in this order (horizontal coordinate, vertical coordinate).</td>
<td></td>
</tr>
<tr>
<td>4. zero pair</td>
<td>D. A mathematical sentence that contains an equal sign, =, indicating that the left side of the equal sign has the same value as the right side.</td>
<td></td>
</tr>
<tr>
<td>5. opposites</td>
<td>E. Operations that undo each other.</td>
<td></td>
</tr>
<tr>
<td>6. ordered pair</td>
<td>F. One of four sections of a coordinate graph formed by two axes.</td>
<td></td>
</tr>
<tr>
<td>7. equation</td>
<td>G. The number by which ( x ) is multiplied in an equation like ( 3x = 12 ).</td>
<td></td>
</tr>
</tbody>
</table>
Use construction paper to make cards with the integers 5, 7, –3, –5, –2, 9, and –1.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. Which integer would be first if you put all of the integers in number order?

2. Which integer would be last if you put all of the integers in number order?

3. What is the order from least to greatest for all of the integers?

4. Tell how you got your answer.

5. If you added the integer –10 to the group of integers, where would it go in the number line?

6. Tell how you got your answer.
7. On Saturday morning, the temperature dropped 3 degrees each hour. If the temperature was 12°F before it started dropping, what was the temperature after 6 hours?

8. What was the temperature after 4 hours?

9. Tell how you got your answer.

10. If the temperature was 15°F before it started dropping, what was the temperature after 6 hours?

11. What was the temperature after 4 hours?

12. Tell how you got your answer.
# Chapter Project Rubric

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

**Algebra: Integers and Equations**  
Four-Door Foldable

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

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

1. Which list shows the integers ordered from least to greatest?
   A. –5, –1, 4, 6       B. –1, 4, –5, 6       C. 4, –5, –1, 6       D. 6, 4, –1, –5
   1. _____

2. Which list shows the integers ordered from greatest to least?
   F. –4, –2, 0, 3       G. 0, –2, 3, –4       H. –4, 3, –2, 0       J. 3, 0, –2, –4
   2. _____

Solve

3. \(-12 + 15 = \) _____________
   A. –3       B. 3       C. 27       D. –27
   3. _____

4. \(-15 – 8 = \) _____________
   F. –23       G. 23       H. 7       J. –7
   4. _____

5. \(4 – (–7) = \) _____________
   A. –11       B. 11       C. 3       D. –3
   5. _____

6. \(8 \times (–7) = \) _____________
   F. –56       G. 56       H. 15       J. –15
   6. _____

7. \(-6 \times (–6) = \) _____________
   A. –36       B. 36       C. 15       D. –15
   7. _____

8. \(48 \div (–6) = \) _____________
   F. –8       G. –42       H. 8       J. 42
   8. _____

Solve each equation.

9. \(w + 5 = –3\)
   A. –8       B. –2       C. 2       D. 8
   9. _____

10. \(-4b = 24\)
    F. –20       G. –6       H. 6       J. 20
    10. _____
11. \( y - 3 = -2 \)
   \[ \text{A.} \ -1 \quad \text{B.} \ 0 \quad \text{C.} \ 1 \quad \text{D.} \ 6 \] 

12. \( -5u = -25 \)
   \[ \text{F.} \ 20 \quad \text{G.} \ 5 \quad \text{H.} \ -5 \quad \text{J.} \ -20 \] 

Use the graph for exercises 13–14.

13. Name the coordinates of Point \( B \).
   \[ \text{A.} \ (-1, 3) \quad \text{B.} \ (1, 3) \quad \text{C.} \ (1, 2) \quad \text{D.} \ (2, 4) \] 

14. Which point has the coordinates \( (0, 0) \)?
   \[ \text{F.} \ \text{Point} \ D \quad \text{G.} \ \text{Point} \ C \quad \text{H.} \ \text{Point} \ B \quad \text{J.} \ \text{Point} \ A \] 

Solve.

15. Don rappelled from a bridge that is 234 feet tall to the bottom of a cave that is 87 feet deep. He says he went a distance of 147 feet. Which shows whether or not this statement is reasonable?
   \[ \text{A.} \ 234 - 87 = 147 \quad \text{C.} \ 234 - 147 = 87 \]
   \[ \text{B.} \ 234 + 87 = 321 \quad \text{D.} \ 234 + 147 = 381 \] 

16. The temperature was \( 12^\circ \text{C} \) at 11 P.M. During the next 4 hours, it dropped 2 degrees each hour. What was the temperature at 3 A.M.?
   \[ \text{F.} \ -14^\circ \text{C} \quad \text{G.} \ -10^\circ \text{C} \quad \text{H.} \ -8^\circ \text{C} \quad \text{J.} \ 4^\circ \text{C} \]
Chapter Test, Form 2A

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

1. Which list shows the integers ordered from greatest to least?
   - A. $-6, 1, -4, 2, 3$
   - B. $-6, -4, 2, 1, 3$
   - C. $3, 2, 1, -4, -6$
   - D. $1, 2, 3, -4, -6$

2. Which list shows the integers ordered from least to greatest?
   - F. $-4, -3, 0, 1, 2$
   - G. $0, 1, 2, 3, -4$
   - H. $-3, -4, 0, 2, 1$
   - J. $1, 2, -3, -4, 0$

Solve.

3. $10 + (-12) =$
   - A. 22
   - B. 2
   - C. $-2$
   - D. $-22$

4. $-15 - 6 =$
   - F. $-21$
   - G. $-9$
   - H. 8
   - J. 21

5. $-6 \times 7 =$
   - A. $-45$
   - B. $-42$
   - C. $-30$
   - D. 35

6. $-49 \div (-7) =$
   - F. 56
   - G. 7
   - H. 0
   - J. $-7$

7. Cecelia had $32 in her checking account. She wrote a check for $48. How much money does she have in the bank after that check is processed?
   - A. $80$
   - B. $16$
   - C. $12$
   - D. $-16$

Solve each equation.

8. $w + 5 = -3.$
   - F. $-8$
   - G. $-2$
   - H. 2
   - J. 8

9. $5x = -25$
   - A. 20
   - B. 5
   - C. $-5$
   - D. $-20$
Chapter 7 Test, Form 2A (continued)

10. $y - 3 = -2$
   F. $-1$  G. $0$  H. $1$  J. $6$  10. _____

Use the coordinate plane for problems 11–13.

11. Name the coordinates for Point $F$.
   A. $(-1, 1)$  C. $(0, 2)$
   B. $(1, -1)$  D. $(-1, -1)$  11. _____

12. Which point has the coordinates $(1, 1)$?
   F. $H$  H. $E$
   G. $G$  J. $I$  12. _____

13. Name the coordinates for Point $G$.
   A. $(1, 1)$  C. $(-1, -1)$
   B. $(0, 0)$  D. $(0, 1)$  13. _____

Solve.

14. A football team started on its own 15-yard line. They gained 8 yards, lost 11, and then gained 9. On which yard line did they end?
   F. 43-yard line  H. 21-yard line
   G. 32-yard line  J. 3-yard line  14. _____

15. The highest point in the U.S. is Mt. McKinley, which is about 20,320 feet above sea level. The lowest point is the bottom of Lake Superior, which is about 1,330 feet below sea level. What is the difference between the highest and lowest points in the U.S.?
   A. 21,650 feet  C. 18,990 feet
   B. 20,320 feet  D. 1,330 feet  15. _____
Read each question carefully. Write your answer on the line provided.

1. Which list shows the integers ordered from **greatest** to **least**?
   - A. \(-6, 1, -4, 2, 3\)
   - B. \(-6, -4, 2, 1, 3\)
   - C. \(3, 2, 1, -4, -6\)

   **1. _____**

2. Which list shows the integers ordered from **least** to **greatest**?
   - F. \(-4, -3, 0, 1, 2\)
   - G. \(0, 1, 2, 3, -4\)
   - H. \(-3, -4, 0, 2, 1\)

   **2. _____**

**Solve.**

3. \(-15 - 6 = \)
   - A. \(-21\)
   - B. \(-9\)
   - C. \(21\)

   **3. _____**

4. \(10 + (-12) = \)
   - F. \(-22\)
   - G. \(-2\)
   - H. \(2\)

   **4. _____**

5. \(-49 ÷ (-7) = \)
   - A. \(-7\)
   - B. \(7\)
   - C. \(56\)

   **5. _____**

6. \(-6 \times 7 = \)
   - F. \(-45\)
   - G. \(-42\)
   - H. \(35\)

   **6. _____**

7. \(-5 \times (-5) = \)
   - A. \(-25\)
   - B. \(0\)
   - C. \(25\)

   **7. _____**

8. Alma had $32. She spent $48. How much money does she have left?
   - F. $80
   - G. $12
   - H. $-16

   **8. _____**

**Solve each equation.**

9. \(y - 3 = -2.\)
   - A. \(-1\)
   - B. \(0\)
   - C. \(1\)

   **9. _____**
10. \(-5x = 25\)
   - F. 20
   - G. 5
   - H. \(-5\)

11. \(w + 5 = -3\)
   - A. \(-8\)
   - B. \(-2\)
   - C. 2

12. \(8u = 64\)
   - F. 8
   - G. 7
   - H. 4.5

13. A football team started on its own 15-yard line. They gained 8 yards, lost 11, and then gained 9. On which yard line did they end?
   - A. 43-yard line
   - B. 32-yard line
   - C. 21-yard line

14. The highest point in the United States is about 20,320 feet above sea level. The lowest point is about 1,330 feet below sea level. What is the difference between these two points?
   - F. 21,650 feet
   - G. 20,320 feet
   - H. 18,990 feet

Use the coordinate plane for problems 15–17.

15. Name the coordinates for Point F.
   - A. \((-1, 1)\)
   - B. \((-1, -1)\)
   - C. \((0, 2)\)

16. Which point is at \((1, 1)\)?
   - F. \(H\)
   - G. \(G\)
   - H. \(E\)

17. Name the coordinates for Point G.
   - A. \((1, 1)\)
   - B. \((0, 0)\)
   - C. \((-1, -1)\)
Read each question carefully. Write your answer on the line provided.

Solve.

1. \(10 + (-12) = \)
2. \(-15 - 6 = \)
3. \(-6 + 6 = \)
4. \(-6 \times 7 = \)
5. Order the integers from greatest to least. \(-6, 1, -4, 2, 3\)
6. Order the integers from least to greatest. \(0, 1, 2, -3, -4\)
7. \(56 \div (-7) = \)
8. \(-49 \div (-7) = \)
9. \(-5 \times (-5) = \)
10. \(-42 \div (-6) = \)
11. Marcus had $32 in his checking account. He wrote a check for $48. How much money does he have in the bank after that check is processed?

Solve each equation.

12. \(t - 5 = -8\)
13. \(5x = 30\)
14. \(m + 8 = -12\)
15. \(-8u = -64\)

Solve.

16. A football team started on its own 15-yard line. They gained 8 yards, lost 11, and then gained 9. On which yard line did they end?
17. The highest point in the United States is Mt. McKinley, which is about 20,320 feet above sea level. The lowest point is the bottom of Lake Superior, which is about 1,330 feet below sea level. What is the difference between the highest and lowest points in the United States?

18. Name the coordinates for Point F.

19. Which point has the coordinates (1, 1)?

20. Name the coordinates for Point G.
Chapter Test, Form 2D

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

Solve.

1. A football team started on its own 15-yard line. They gained 8 yards, lost 11, and then gained 9. On which yard line did they end?

2. The highest point in the United States is about 20,320 feet above sea level. The lowest point is about 1,330 feet below sea level. What is the difference between these two points?

3. Teresa had $32 in her checking account. She wrote a check for $48. How much money does she have in the bank after that check is posted?

4. \[56 \div (-7) = \]

5. \[-49 \div (-7) = \]

6. \[-5 \times (-5) = \]

7. \[-42 \div (-6) = \]

8. \[10 + (-12) = \]

9. \[-15 - 6 = \]

10. \[-6 + 6 = \]

11. \[-6 \times 7 = \]

12. Order from greatest to least. \(-6, 1, -4, 2, 3\)

13. Order from least to greatest. \(0, 1, 2, -3, -4\)

Solve each equation.

14. \[z + 8 = -12.\]

15. \[5x = 30\]
16. $c - 5 = -9$

17. $8u = 72$

Use the coordinate plane for problems 18–20.

18. Name the coordinates for Point $F$.

19. Which point has the coordinates $(1, 1)$?

20. Name the coordinates for Point $G$. 
Chapter Test, Form 3

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

Simplify each expression.

1. $44 + (-12) ÷ 4 =$
2. $-2(-9 - 6) =$
3. $-9(-6 + 6) =$
4. $-6 \times 7 + 4 =$
5. $56 ÷ (-7) - 5 =$
6. $-49 ÷ (-7) + (-5) =$
7. $-5 \times (-5) + 11 =$
8. $-42 ÷ (-6) \times (-3) =$

Solve.

9. The highest point in the United States is Mt. McKinley, which is about 20,320 feet above sea level. The lowest point is the bottom of Lake Superior, which is about 1,330 feet below sea level. What is the difference between the highest and lowest points in the United States?

10. Order the integers from greatest to least. $-6, 1, -4, 2, 3$

11. Order the integers from least to greatest. $0, 1, 2, -3, -4$

12. Rodney had $109 dollars in his checking account. He wrote a check for $126. How much money does he need to put into his account in order to cover the difference?

13. A football team started on its own 15-yard line. They gained 8 yards, lost 11, and then gained 9. On which yard line did they end?
Solve each equation.

14. \(a - 1.2 = 4.6\)
15. \(-6y = -90\)
16. \(x + 15 = -12\)
17. \(x - \frac{1}{4} = \frac{3}{4}\)

Use the coordinate plane for problems 18–20.

18. Name the coordinates for Point F.
19. Which point has the coordinates \((1, 1)\)?
20. Graph Point M at \((3, -2)\)
1. In this chapter, you learned about several concepts and methods to help you understand integers.
   a. How is a zero pair similar to a pair of opposite integers? Explain in your own words.
   b. Explain how to add integers with different signs using counters and zero pairs. Give an example.
   c. Using the same example you used above, explain how to add integers with different signs using a number line.
   d. Explain how to subtract a negative integer from a negative integer using opposites. Provide an example.

2. Look at the following problems and tell whether you think the answer will be a positive or negative number. Explain your reasoning.
   a. $14 \times (-38)$
   b. $-37 \times (-98)$
   c. $136 \div (-4)$
   d. $-720 \div (-8)$

3. Describe step-by-step how to graph the following coordinate pairs: $S(5, -1), T(-4, 3), U(-2, -2)$.

4. Write an equation to solve each of the problems below. Then, solve the problem using your equation. Explain your steps.
   a. At dawn in Oslo, Norway, the temperature was $-15^\circ F$. By lunchtime, the temperature was $3^\circ F$. How many degrees did the temperature rise?
   b. The area of a tennis court is 2,808 square feet. If the length of the court is 78 feet, how wide is the tennis court?
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
11. A  B  C  D
The locations of the sand box, sliding board, swings, and merry-go-round on the playground are shown on the coordinate plane. Which ordered pair represents the location of the swings?

Read the Item
You need to find the ordered pair that represents the location of the swings.

Solve the Item

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Start at the origin. Move left to the x-axis to find the x-coordinate of the swings, which is $-4$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Move down the y-axis to find the y-coordinate, which is $-4$.</td>
</tr>
</tbody>
</table>

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

Refer to the coordinate plane on page 89 for exercises 1–2.

1. A new jungle gym will be built at (1, 2). To which of the other locations will it be closest?
   A. merry-go-round  
   B. sliding board  
   C. swings  
   D. sand box  

2. Which of these ordered pairs is a possible location for a picnic table if \( x = 4 \)?
   F. \((3, 4)\)  
   G. \((3, 6)\)  
   H. \((2, 2)\)  
   J. \((4, 1)\)  

3. Order the integers from least to greatest. \(-4, -9, 3, 2, -1\)
   A. \(-1, 2, 3, -4, -9\)  
   B. \(-9, -4, -1, 2, 3\)  
   C. \(-4, -1, 2, 3, -9\)  
   D. \(3, 2, -1, -4, -9\)  

4. If \( h = 4 \), find the value of \(5h + 4\).
   F. \(-24\)  
   G. \(24\)  
   H. \(20\)  
   J. \(16\)  

5. The equation of line \( j \) is \( y = 5 \). Which ordered pair is located on line \( j \)?
   A. \((3, 5)\)  
   B. \((2, 2)\)  
   C. \((-1, 4)\)  
   D. \((2, 3)\)
Cumulative Standardized Test Practice (continued)

6. $-3 + (-4) =$  
   F. $-7$   G. $7$   H. $-1$   J. $1$  

7. $-7 + 5 =$  
   A. $-2$   B. $2$   C. $-12$   D. $12$ 

8. It costs $0.25 to run a washer in the Laundromat for $\frac{1}{4}$ of an hour. How much does it cost to run the dryer for 1 hour?  
   F. $1.00$   G. $1.25$   H. $1.70$   J. $2.00$

9. What is the area of a square with a side measurement of 9 m?  
   A. $18 \text{ m}^2$   B. $18 \text{ m}$   C. $81 \text{ m}^2$   D. $81 \text{ m}$

10. Jessica has $45 in the bank. She writes a check for $58. How much does she have left? Write the mathematical sentence that represents this situation.

   Compare. Write $>$, $<$, or $=$.

11. $-10 \bigcirc -6$  
12. $-2 \bigcirc 0$

Use the number line for questions 13–15.

13. Start at 0. Move 4 spaces to the right. What number do you stop on?  
14. Start at $-7$. Move 2 spaces to the left. What number do you stop on?  
15. How many spaces do you need to move to get from $-2$ to 2? Do you move to the left or right?  
16. $3 \times (-4) =$  
17. $x - 3 = 0$
### Anticipation Guide

**Algebra: Integers and Equations**

#### Before you begin Chapter 7

- 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>A, D, or NS</th>
<th>STEP 2 A or D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the expression $3x$, $3$ is the coefficient.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>2. Addition is the inverse operation for subtraction.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>3. A quadrant is one of four sections of a coordinate graph formed by two axes.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>4. Subtraction is the inverse operation for division.</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>5. A zero pair is a pair of counters that includes one positive counter and one negative counter.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6. Opposites are numbers that are the same distance from zero in opposite directions.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>7. An ordered pair is a pair of numbers that are the coordinates of a point in a coordinate plane or grid in this order (horizontal coordinate, vertical coordinate).</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>8. An equation is a mathematical sentence that contains an equal sign, $=$, indicating that the left side of the equal sign has the same value as the right side.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>9. In the expression $4x$, $2$ is the coefficient.</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>10. In the expression $6x$, $x$ is the coefficient.</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

#### 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.
Ordering Integers

An integer is a whole number or its opposite. You can use a number line to show integers.

Opposite integers, like -4 and 4, are the same distance from 0. For two integers on a number line, the greater integer is farther to the right.

You can use a number line to compare integers. Compare -2 and 1. You can see that 1 is farther to the right.

So, $1 > -2$ or $-2 < 1$.

Write < or > to make a true sentence.

1. $-3 < 5$
2. $-2 > -8$
3. $5 < 9$
4. $8 > -3$
5. $0 < 4$

Order each set of integers from least to greatest.

10. $2, -3, 0$
11. $-3, 0, 2$
12. $-14, 14, -17, 28$
13. $-42, 44, -47, 48$
14. $-62, 58, -17, 13$

Solve.

25. The low temperature on Saturday was $-5^\circ F$. The low temperature on Sunday was $-9^\circ F$. Which day was colder?

Sunday

gain; 6 yd
7–1 Name __________________________ Date ________________ 5NS1.5

**Homework Practice**

**Ordering Integers**

Replace each \( < \) or \( > \) to make a true sentence.

1. \(-5 < 0\)
2. \(25 > -15\)
3. \(60 > 40\)
4. \(12 > 10\)
5. \(4 > -5\)
6. \(19 > 18\)
7. \(-6 < -3\)
8. \(75 > 90\)
9. \(-3 < -2\)
10. \(83 > 59\)
11. \(-41 < -43\)
12. \(87 > -87\)

Order each set of integers from least to greatest.

13. \(14, 11, 2, 8, 9, 11, 14\)
14. \(-50, 167, -240, 34, 17, 95, 167\)
15. \(-68, -113, 2, 89, 62, 7, -90\)
16. \(7, 81, 5, 12, -5, 100, 64\)
17. \(37, -90, 9, 16, 25, 432, -900\)

Solve.

18. Anya, Carolina, and Maria are all waiting for their trains to arrive. Anya’s train will arrive at 11 A.M., Carolina’s train will arrive at 11:30 A.M., and Maria’s train will arrive an hour before Carolina’s. Order the three by who will arrive first.

**Maria, Anya, Carolina**

---

**Spiral Review**

Divide. Write in simplest form. (Lesson 6–11)

19. \(5 \div \frac{3}{5} = \frac{25}{3}\)
20. \(12 \div \frac{3}{4} = 16\)
21. \(\frac{4}{9} \div \frac{1}{8} = \frac{32}{9}\)

---

Grade 5 10 Chapter 7

Answers (Lesson 9–1)
Answers (Lessons 7–1 and 7–2)

Chapter 7

You can use a number line to add integers. Move to the right to add positive integers. Move to the left to add negative integers.

Add 4 + (–6).

Graph 4 on the number line. Add 6 places to the left from 4.

Read your final position on the number line. 

The sum of two positive integers is positive.

The sum of two negative integers is negative.

The sum of a positive integer and a negative integer has the sign of the integer farther from 0.

Add.

1. –8 + 7 = −1

2. 14 + (−3) = 11

3. −8 + 8 = 0

4. 16 + 4 = 20

5. 1 + 0 = 1

6. −6 + (−8) = −14

Add 6.

Move 6 places to the left from 4.

Read your final position on the number line.

1. Write an integer to show the location for each item.

2. Write the opposite for each integer. Tell which can be found in that location.

3. Compare the locations of each pair. Circle the location showing the greater integer.

4. Order the integers from least to greatest.

Grade 5

A4

Chapter 7
### Skills Practice
#### Adding Integers

**Add.**

1. $-12 + 5 = \text{?}$
2. $-7 + (-5) = \text{?}$
3. $10 + 6 = \text{?}$
4. $-15 + 15 = \text{?}$
5. $11 + (-13) = \text{?}$
6. $-10 + 2 = \text{?}$
7. $17 + (-19) = \text{?}$
8. $-20 + 4 = \text{?}$
9. $10 + (-11) = \text{?}$
10. $-4 + 16 = \text{?}$
11. $7 + (-14) = \text{?}$
12. $-14 + 8 = \text{?}$
13. $30 + (-8) = \text{?}$
14. $-12 + 2 = \text{?}$
15. $13 + (-7) = \text{?}$
16. $-21 + 12 = \text{?}$
17. $4 + (-4) = \text{?}$
18. $7 + (-8) = \text{?}$
19. $1 + (-7) = \text{?}$
20. $3 + (-6) = \text{?}$
21. $-2 + (-3) = \text{?}$

**Solve.**

22. Steve is standing at sea level. He walks 9 feet down, then 4 feet up, then 3 feet down a tunnel. How many feet above or below sea level is he standing now? Write the answer as an integer.

-8 feet below sea level; $-8$

23. The temperature at 8 A.M. was $-5^\circ\text{C}$. At 10 A.M. the temperature was $3^\circ\text{C}$ warmer. At 4 P.M. the temperature was $4^\circ\text{C}$ colder than at 10 A.M. What was the temperature at 4 P.M.?

$-6^\circ\text{C}$

### Homework Practice
#### Adding Integers

**Add.**

1. $+3 + (+4) = \text{?}$
2. $+9 + (+8) = \text{?}$
3. $6 + (-12) = \text{?}$
4. $+9 + (+15) = \text{?}$
5. $-7 + (+17) = \text{?}$
6. $2 + (-1) = \text{?}$
7. $+13 + (-4) = \text{?}$
8. $+4 + (-7) = \text{?}$
9. $-5 + (-15) = \text{?}$

**Solve.**

10. The temperature outside is $-2^\circ\text{F}$. If the temperature rises 2 degrees, what will the temperature be? $0^\circ\text{F}$

11. At halftime in a football game, team A has lost 16 yards ($-16$) and team B has lost 32 yards ($-32$). How many total yards were lost? Write as an integer.

$-48$ yards

### Spiral Review

Replace each $igcirc$ with $<$ or $>$ to make a true sentence. (Lesson 7–1)

12. $-80 \bigcirc 80$
13. $6 \bigcirc 5$
14. $-99 \bigcirc 7$
15. $-8 \bigcirc 0$
16. $-202 \bigcirc -252$
17. $12 \bigcirc 8$
18. $-25 \bigcirc -20$
19. $75 \bigcirc 85$
20. $43 \bigcirc -86$

Order each set of integers from least to greatest.

21. $54, 52, -2, -8, 91$
22. $-70, 22, -80, 34, 756, -965$
23. $-4, -13, 2, -9, 52, 24, -90$

Answers

Lesson 7–1
Problem-Solving Practice

Adding Integers

Solve.

1. Before halftime in a football game, a team scored 21 points. After halftime, the team scored 6 more points. How many points did the team score?

27 points

2. The temperature outside is 80°F. If the temperature rises 10°F, what will the temperature be?

90°F

3. The temperature in Tahoe is -1°C. If the temperature falls 6°C, what will the temperature be?

-7°C

4. Diego and Ana are playing a board game. They both start on the same square. Diego first moves forward 2 squares, and on his next turn he moves backward 1 square. On her first turn, Ana moves forward 6 squares, and on her next turn she moves forward 4 squares. Who is ahead?

Ana

5. Later in the game, Ana is forced to move back 10 squares, but then gains 1 square. How many squares back is she?

-9 squares

6. During the next 6 plays, Diego loses 12 squares, but he also gains 12 squares. How many squares does he gain?

0 squares

Enrich

Adding Integers

One African-American inventor of the late nineteenth century had many patents. Who was he and which patent of 1890 became a common household item?

Find the sum of the number in the center of each ring and each of the numbers in the middle ring. Write the sum in the corresponding space in the outer ring.

Circle the letter of each negative sum in the outer ring. Starting at the arrow and moving in a clockwise direction, write each circled letter in the blanks below.

The inventor's name was \text{W.B. Purvis}

and his most famous invention was the \text{Fountain Pen}.
To subtract an integer, add its opposite.

Subtract 5 − 8.
Add the opposite. Use the number line to find 5 + (−8).
Remember: Move to the left on the number line to add negative numbers.

\[ \begin{array}{ccccccccccc} & & & & & & & & -6 & -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\ \end{array} \]

So, 5 − 8 = −3.

Subtract −2 − (−4).
Add the opposite. Use the number line to find −2 + 4.
Remember: Move to the right on the number line to add positive numbers.

\[ \begin{array}{cccccccccccccccccc} & & & & & & & & -6 & -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \end{array} \]

So, −2 − (−4) = 2.

Subtract. You may use the number line.

1. \(-7 – 2 = -9\)
2. \(6 – (−3) = 9\)
3. \(14 – (−5) = 19\)
4. \(-2 – 1 = -3\)
5. \(-9 – (−4) = -5\)
6. \(-9 – 0 = -9\)
7. \(-7 – (−2) = -5\)
8. \(-3 – (−5) = 2\)
9. \(10 – (−9) = 19\)
10. \(-5 – 3 = -8\)
11. \(0 – (−8) = 8\)
12. \(16 – (−6) = 22\)
13. \(7 – (−2) = 9\)
14. \(7 – (−4) = 11\)
15. \(-8 – 12 = -20\)

Solve.

25. After a rocket reached an altitude of 13,480 ft, it separated from the main engines. The engines sank into the ocean to a depth of 1,550 ft. How far did the engines fall? 15,030 ft

26. When an airplane flew at an altitude of 5,000 ft, the temperature was −15°F outside. When the airplane reached an altitude of 10,000 ft, the temperature was −28°F outside. What was the difference in temperature? 13°F
Subtract.

1. 7 - 2 = 5
2. -9 - (-5) = -4
3. -4 - (-4) = 0
4. -9 - 10 = -19
5. -7 - (-3) = -4
6. 0 - (-1) = 1
7. -15 - 8 = -23
8. -9 - (-3) = -6

ALGEBRA

9. Evaluate \( a - b \) if \( a = 8 \), and \( b = 10 \). \( \Box \)
10. Find the value of \( m - n \) if \( m = -5 \), and \( n = 10 \). \( \Box \)

Add. (Lesson 7-2)

11. -7 + 2 = -5
12. +9 + (-5) = 4
13. -4 + (-10) = -14
14. +9 + (-18) = -9
15. -7 + (-3) = -10
16. 0 + (-1) = -1
17. +15 + 8 = 23
18. -9 + (-3) = -12

Solve.

19. The temperature outside is 23°C. If the temperature drops 24 degrees, what will the temperature be?

\[ -1°C \]

20. At the start of a board game, with both players starting in the same square, Mary moved forward 8 squares and on her next turn backward 7 squares. On his first turn, Joe didn’t move at all, but moved 2 squares on his second turn. Who is ahead?

Joel
### 7-3 Enrich

#### Subtracting Integers

I am a two-digit number. My tens digit is greater than my ones digit. The difference of my digits is 1.

Shade in the boxes that contain a correct answer below the subtraction. Now you can find out what number I am.

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<thead>
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<td>-8 - 48</td>
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<td>-20 - (-42)</td>
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<td>3</td>
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<td>44</td>
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<td>-37</td>
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</tbody>
</table>

### 7-4 Reteach

#### Multiplying Integers

You can use these rules to multiply integers:

- If the signs of the integers are the same, the product is positive.
- If the signs of the integers are different, the product is negative.

\[-3 \times (-2) = 6\] \[4 \times 6 = 24\]

\[-3 \times 5 = -15\] \[2 \times (-6) = -12\]

The chart shows the properties of multiplication of integers.

<table>
<thead>
<tr>
<th>Property</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commutative Property for Multiplication</td>
<td>For any integers $a$ and $b$, $ab = ba$.</td>
</tr>
<tr>
<td>$\text{For any integers } a, b, c, (a \times b) \times c = a \times (b \times c).$</td>
<td>$(-2 \times 3) \times 5 = -2 \times (3 \times 5)$</td>
</tr>
<tr>
<td>Associate Property for Multiplication</td>
<td>For any integers $a, b, c$, $(a \times b) \times c = a \times (b \times c)$.</td>
</tr>
<tr>
<td>Identity Property for Multiplication</td>
<td>For any integer $a$, $a \times 1 = a$.</td>
</tr>
<tr>
<td>$\text{For any integer } a, a \times 0 = 0$.</td>
<td>$-9 \times 0 = 0$</td>
</tr>
<tr>
<td>Zero Property for Multiplication</td>
<td>For any integer $a$, $a \times 1 = a$.</td>
</tr>
</tbody>
</table>
| Distributive Property for Multiplication over Addition | For any integers $a, b, c$, \[\text{For any integers } a, b, c, (a \times (b + c) = (a \times b) + (a \times c).}\]

#### Multiply

1. $7 \times (-2) = -14$
2. $5 \times 8 = 40$
3. $9 \times (-3) = -27$
4. $5 \times (-3) = -15$
5. $-8 \times 6 = -48$
6. $-5 \times (-3) = 15$
7. $7 \times 8 = 56$
8. $-2 \times (-9) = 18$
9. $-3 \times (-6) = 18$
10. $-6 \times (-6) = 36$
11. $-9 \times (-3) = 27$
12. $-6 \times (-2) = 12$
13. $-10 \times 6 = 60$
14. $-5 \times 4 = -20$
15. $8 \times (-5) = -40$
Multiply.

1. $8 \times (-3) = -24$
2. $-3 \times (-10) = 30$
3. $10 \times (-4) = -40$
4. $2 \times (-5) = -10$
5. $9 \times (-9) = -81$
6. $-9 \times (-7) = 63$
7. $8 \times (-6) = -48$
8. $-7 \times 8 = -56$
9. $7 \times (-3) = -21$
10. $-13 \times 1 = -13$
11. $-3 \times (-6) = 18$
12. $-2 \times (-2) = 4$
13. $-3 \times (-13) = 39$
14. $10 \times (-5) = -50$
15. $5 \times (-4) = -20$
16. $-4 \times (-8) = 32$
17. $9 \times (-4) = -36$
18. $-4 \times (-11) = 44$
19. $2 \times (-2) \times 8 = 32$
20. $3 \times (-4) \times 6 = -72$
21. $6 \times (-3 \times 3) = 54$
22. $13 + [9 \times (-6)] = -41$
23. $10 \times (-4) + [5 \times (-6)] = -29$
24. $16 - [5 \times (-5)] = 41$

Solve.

25. Which has the greatest product: $5 \times (-5)$ or $-5 \times (-5)$?

$-5 \times (-5) = 25$

26. The price of stock in the Omega Company for Monday went up $5 per share. If Judy owns 32 shares, how much did her stock holdings change in value? Write this as an integer.

$5 \times 32 = 160$
**Problem-Solving Practice**

*Multiplying Integers*

**Solve.**

1. For the past 5 years, the population of a city has decreased by 16 people a year. What is the city’s population loss in relation to 5 years ago?

   **—80 people**

2. Rey forgot his lunch money for the past 4 days and borrowed money from the cafeteria. If lunch costs $2.25, write an integer to show his balance for the past 4 days.

   **—$9**

3. Lina is reading a novel. She reads 29 pages each night for 6 nights. Write an integer to show the number of pages that Lina has read.

   **174 pages**

4. The temperature in Carla’s city is decreasing. For the past 9 days, the temperature has decreased by 3 degrees Fahrenheit each day. Write an integer to show how much the temperature has decreased.

   **—27°F**

5. A public school loses 20 students each year due to transfers. If this pattern continues for the next 2 years, what will be the loss in relation to the original enrollment?

   **—40 students**

6. Ozzy and Paul discovered a buried treasure. For 10 days, they removed 5 cubic meters of dirt each day from the site. What integer represents the change in the amount of soil at the site?

   **—50 cubic meters**

---

**Enrich**

*Negative Exponents*

Magic square entries can be converted to exponents to create Exponent Squares, which can be made into Multi-Magic Squares. The products of the numbers in each row, column, or diagonal are the same in a Multi-Magic Square.

**Addition Square**

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**Convert to exponents.**

1. $2^{-3}$
2. $2^{1}$
3. $2^{-3}$

**Complete Multi-Magic Square.**

1. $\frac{1}{4}$
2. $8$
3. $4$

Find the product of the Multi-Magic Square above. **64**

Complete the squares.

**1. Addition Square**

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</tbody>
</table>

**Convert to exponents. Use a base of 2.**

1. $2^{-3}$
2. $2^{1}$
3. $2^{-3}$

**Multi-Magic Square**

1. $\frac{1}{4}$
2. $8$
3. $4$

**Product:** **8**

**2.**

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<td>3</td>
</tr>
<tr>
<td>4</td>
<td>—3</td>
<td>2</td>
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</tbody>
</table>

**Product:** **27**
Reteach
Problem-Solving Strategy

Work Backward

A scientist plans to study exotic birds in the rain forest. The helicopter flight to and from the rain forest costs $499. Supplies cost $112 each day. How many days can the scientist spend in the rain forest on a $1,283 budget?

Step 1
Understand

Be sure you understand the problem.
Read carefully.
What do you know?

• A helicopter flight costs $499.
• Supplies cost $112 each day.
• The budget is $1,283.

What do you need to find?

• The number of days she can stay in the rain forest.

Step 2
Plan

Make a plan.
Choose a strategy.
You can work backward to find the number of days the scientist can stay in the rain forest.
Use math operations to undo each step.

Step 3
Solve

Carry out your plan.

Decide which operation undoes each step.

Undo the addition of the cost of the helicopter.

Which operation undoes addition? Subtraction

Subtract the cost of the helicopter from the total budget:

$1,283 − $499 = $784

The scientist has $784 left after paying for the helicopter.

Undo the multiplication of the number of days the scientist can stay in the rain forest.

Which operation undoes multiplication? Division

Divide the amount remaining by the cost of supplies for each day.

$784 ÷ $112 = 7 days

How many days can the scientist stay in the rain forest? 7 days

Step 4
Check

Is the solution reasonable?
Reread the problem.
Have you answered the question? Yes.
How can you check your answer?
Answers may vary. Possible answer:
Work forward.

Solve. Use the work backward strategy.

1. Ms. Robin’s class is planting trees for Arbor Day. They raise a total of $80 to buy trees and supplies. A local nursery has offered to provide trees for $7 each. They spend $17 on supplies. How many trees do they buy?

9 trees

2. Mr. Stone’s class visits the aquarium. Mr. Stone has $46 for the trip. The entrance fee for the class is $34. The rest of the money is used to buy posters for the classroom. Each poster costs $3. How many posters does Mr. Stone buy?

4 posters
Work Backward

Solve. Use the work backward strategy.

1. Ms. Houston’s fifth grade class is going to a dinosaur park. The class raises $68 for the trip. Transportation to the park costs $40. The park sells small fossils for $4 each. How many fossils can they buy with the money they have left?

7 fossils

2. Time Kusuo’s baseball game begins at 5:00 P.M. Kusuo wants to arrive 45 minutes early to warm up. If it takes him \( \frac{1}{2} \) hour to get to the baseball field, what time should Kusuo leave his home for the game?

3:45 P.M.

Use any strategy to solve.

3. A theater seats 44 people. For Friday evening performances, 128 tickets were sold. How many performances were there on Friday evening?

3 performances

4. Science Many huskies have one brown eye and one blue eye and others have two blue eyes. In a group of 22 huskies, there were 38 blue eyes. How many of the dogs have two blue eyes?

16 dogs

5. Number Sense Steffy picks a number, subtracts 13, and then multiplies the difference by 2. Finally, she adds 8 to the product. Her final number is 122. What was her starting number?

70

6. Create a problem for which you could work backward to solve. Share it with others.

Problem: A number is divided by 3. Next, 2 is subtracted from the quotient. Then, 4 is added to the difference. If the result is 12, what is the number?

Check students’ problems.

Spiral Review

Multiply. (Lesson 7–4)

5. \( 10 \times (–2) = \boxed{–20} \)

6. \( 3 \times (6) = \boxed{18} \)

7. \( 4 \times (–2) = \boxed{–8} \)

8. \( 9 \times (–9) = \boxed{–81} \)

9. \( –16 \times (–1) = \boxed{16} \)

10. \( –6 \times (–10) = \boxed{60} \)

11. \( 12 \times (–4) = \boxed{–48} \)

12. \( 8 \times (–7) = \boxed{–56} \)

13. \( –9 \times 6 = \boxed{–54} \)

14. \( 50 \times (–1) = \boxed{–50} \)
Use Properties of Operations

If the solutions to the equations are incorrect, cross out the letters in the box below. The remaining letters will spell out a message.

B. \(2x + 1 + 4 = 9\)  correct  P. \(7 \div 9 = 1\) incorrect  c = 18 incorrect
I. \(3m + 4m = 21\)  correct  C. \(9 \div 14 = 23\) incorrect  x = 184 incorrect
L. \(13 = 5 + 4y\)  incorrect  Q. \(2(y - 7) = 0\)  correct  y = 7 correct
X. \(2(x + 1) = 5\)  incorrect  K. \(6(a + 4) = 110\)  correct  a = 16 incorrect
W. \(2 + 3x = 5\)  correct  F. \(\frac{3}{4}m + 1 = 9\)  incorrect  m = 12 incorrect
S. \(8x - 3x = 20\)  correct  E. \(5n - 21 = 24\)  correct  n = 9 correct
M. \(15 = 2(n + 1)\)  incorrect  H. \(2(y - 6) = 4\) correct  y = 8 correct
N. \(11 = 3 + 4x\)  correct  J. \(2x - 8 = 10\) incorrect  x = 8 incorrect
R. \(4m + 2m + 3 = 15\)  correct  Q. \(3(x - 7) = 32\)  incorrect  x = 13 incorrect
F. \(\frac{3}{2}n - 5 = 4\)  correct  G. \(\frac{3}{2}n - 5 = 4\)  correct  n = 21 correct
S. \(27 = 11p + 9\)  incorrect  U. \(78 = 9w - 7w + 6\)  correct  w = 36 correct
D. \(\frac{5}{8}a + 30 = 35\)  correct  Y. \(\frac{2}{5} - 7 = 8\)  correct  f = 25 correct

You have the right answer.

You can use these rules to divide integers.

If the signs of the integers are the same, the quotient is positive. If the signs of the integers are different, the quotient is negative.

\(-30 \div (-6) = 5\)  16 \div 8 = 2\)
\(-21 \div 7 = -3\)  36 \div (-9) = -4

Divide. Multiply to check division.

1. \(14 \div (-2) = -7\)  2. \(8 \div 2 = 4\)  3. \(27 \div (-3) = 9\)
4. \(-15 \div (-3) = 5\)  5. \(24 \div 8 = 3\)  6. \(-96 \div (-12) = 8\)
7. \(40 \div 10 = 4\)  8. \(8 \div 2 = -4\)  9. \(-6 \div (-3) = 2\)
10. \(36 \div (-6) = -6\)  11. \(-9 \div (-3) = 3\)  12. \(-6 \div (-2) = 3\)
13. \(-60 \div (-20) = 3\)  14. \(-20 \div 4 = -5\)  15. \(40 \div (-8) = -5\)
16. \(32 \div (-16) = -2\)  17. \(-14 \div 7 = -2\)  18. \(-36 \div 4 = -9\)
19. \(20 \div 4 = 5\)  20. \(16 \div 4 = 4\)  21. \(-32 \div 8 = 4\)
22. \(-12 \div 3 = -4\)  23. \(-10 \div 2 = 5\)  24. \(-15 \div -3 = 3\)
25. \(-\frac{2}{9} = -8\)  26. \(-\frac{9}{-3} = 3\)  27. \(96 \div -8 = -12\)
28. \(9\div 3 = 4\)  29. \(6\div -54 = -9\)  30. \(-8\div 32 = -4\)
31. \(11\div 33 = 3\)  32. \(-2\div -8 = 4\)  33. \(-5\div 25 = -5\)
34. \(4\div -20 = -5\)  35. \(5\div 21 = 7\)  36. \(-60\div -120 = 2\)
Divide.

1. \(-24 \div 8 = -3\)
2. \(-30 \div (-10) = 3\)
3. \(-40 \div (-4) = 10\)
4. \(-10 \div 2 = -5\)
5. \(-81 \div 9 = -9\)
6. \(63 \div (-7) = -9\)
7. \(-48 \div (-6) = 8\)
8. \(-56 \div (-8) = 7\)
9. \(-21 \div 7 = -3\)
10. \(-13 \div 1 = -13\)
11. \(18 \div (-6) = -3\)
12. \(4 \div (-2) = -2\)
13. \(39 \div 3 = 13\)
14. \(-50 \div (-25) = 2\)
15. \(-20 \div (-5) = 4\)

Find the value of each expression.

16. \([18 \div (-2)] \times 8 = -72\)
17. \([28 \div (-4)] \times 6 = -42\)
18. \(36 \div (-3 \times 3) = -4\)
19. \(13 + [18 \div (-6)] = 10\)
20. \([10 \times (-4)] \div 5 = -8\)
21. \(16 - [25 \div (-5)] = 21\)

ALGEBRA

13. Find the value of \(c \div d\) if \(c = -30\) and \(d = 3\).

\[\frac{-30}{3} = -10\]

14. What value of \(m\) makes \(27 \div m = -9\) true?

\[m = -3\]

Solve.

15. Karen lost a total of 10 points over the last 2 rounds of a game. If she lost the same number of points each round, what integer represents her change in score each round?

\[\frac{-10}{2} = -5\]

Spiral Review

16. A number is multiplied by 10, and then \(-15\) is added to the product. The result is 35. What is the number?

\[10n + (-15) = 35\]

\[n = 5\]
Evaluate each numerical expression. Put the letters above the answers at the bottom of the page to answer the questions.

Y. \(-52 \div 4 = \) \(-13\)
A. \(-72 \div (-9) = \) \(8\)
S. \(-24 \div (-12) = \) \(2\)
L. \(-100 \div (-20) = \) \(5\)
N. \((-3 + (-9)) \div 4 = \) \(-3\)
V. \(6 + (-15) \div 5 = \) \(3\)
R. \((8 \times (-8)) \div (4 \times (-4)) = \) \(4\)
K. \((21 - (-7)) \div 4 = \) \(7\)
L. \(30 \div (-5) + 40 \div (-8) = \) \(-11\)
T. \(15 - (-25) \div 5 = \) \(20\)
U. \(-45 \div 5 + 24 \div (-3) = \) \(-17\)
A. \(-49 \div 7 - (-3) = \) \(-4\)
H. \((12 \times (-6)) \div (-4 - 4) = \) \(9\)
N. \((2 + 50) \div (-2) = \) \(-26\)

Who was the first woman to walk in space?

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<th>T</th>
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<td>-11</td>
<td>-12</td>
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</table>
Choose the Best Strategy

The high tide at Sunshine Beach on Monday was 7 feet. The low tide on Monday was −3 feet. Molly claimed that the difference in the heights of the tides was 4 feet. Use logical reasoning to find out if Molly’s claim is correct.

Step 1
Understand
What do you know?
High tide was \(7 \text{ ft}\) and low tide was \(-3 \text{ ft}\).
What do you need to find out?
whether a difference of 4 feet is correct

Step 2
Plan
Which operation should you use to find the difference in the heights of the tides? subtraction
What is Molly’s claim?
Molly claimed that \(7 \text{ ft} - (-3) = 4\).

Step 3
Solve
Complete.
The difference between a positive integer and a negative integer is always greater than the positive integer.
Evaluate Molly’s claim. Explain.
The difference \(7 - (-3)\) must be greater than 7.
Since \(4 < 7\), Molly’s claim is not reasonable.

Step 4
Check
To check, find the difference.
\(7 - (-3) = 7 + 3 = 10\).
The difference was 10 ft.

Use any strategy shown below to solve.
- Use logical reasoning
- Work backward
- Guess and check
1. On Thursday, the high tide reached 4 feet. The low tide on Thursday was 7 feet lower than high tide. Glen calculated that the low tide was 3 feet. Is his calculation correct? Explain.
   No; the low tide was −3 ft.
2. At 2 A.M., the temperature was −3°F. By 6 A.M., the temperature had risen 4°F. Carmen calculates the temperature at 6 A.M. is 1°F. Is her calculation correct? Explain.
   Yes; \(-3 + 4 = 1\).

3. Your parents have given you twice as many dollars as your age on each birthday since your fifth birthday. If you are 10 years old, how much money have you been given over the years?
   \(\text{\$90}\)

4. Find the missing term in the pattern below.
   
   
   
   
   
   $\ldots, 2, 5, 8, 11, 14$
   
   $\ldots, 2, 5, 8, 11, 14$

5. Sarah needs to arrive at work at 7:45 A.M. It takes her 12 minutes to drive to her office, 15 minutes to make and eat breakfast, and 37 minutes to get ready. What time does she need to set her alarm for to get to work on time?
   
   
   
   
   
   $\text{6:41 A.M.}$
   
   
   

6. On Wednesday, 72 cookbooks were sold at a book sale. This is 9 more than one half the amount sold on Tuesday. How many cookbooks were sold on Tuesday?
   
   
   
   
   
   $126$ cookbooks
   
   
   

7. Robert has 39 model cars and his brother, Frank, has 56 model cars. How many more model cars does Robert need to have the same number as his brother?
   
   
   
   
   
   $17$ cars
   
   
   

8. The local pet store made a profit if \$300 in March, but only made a profit of \$150 in April. How much more did the pet store make in March?
   
   
   
   
   
   $\text{\$150}$
   
   
   

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7-7

Name __________________________ Date __________________

Skills Practice
Problem-Solving Investigation

Choose the Best Strategy

Use any strategy shown below to solve.
- Use logical reasoning
- Work backward
- Guess and check

1. At 3 A.M., the tide was −4 feet. By 9 A.M., the tide had risen 6 feet. Andre calculates that the tide reached 10 feet at 9 A.M. Is his calculation correct? Explain.

No; the tide is 2 feet high.

2. A scuba diver descended 8 feet below the surface of the water. Then he descended an additional 12 feet. He then ascends 3 feet. Write an integer to show his distance from the surface.

−17 feet

3. A croquet ball has a mass of 460 grams. Together, the mass of a golf ball and a croquet ball is the same as the mass of 11 golf balls. What is the mass of one golf ball?

46 grams

4. The temperature recorded at 5 A.M. was 25°F. The temperature increased by 2°F for every hour for the next four hours. What was the temperature at the end of the four hours?

33°F

Choose the correct answer.

At Clearview Beach, the lowest tide of the year was −9 feet. The highest tide for the year was 12 feet.

5. Which of the following is true?
   A The range in the highest and lowest tides for the year is 21 feet.
   B The tide changes by 3 feet from high tide to low tide.
   C The highest tide for the year reached 21 feet.
   D The lowest tide for the year reached −12 feet.

6. When checking if an answer is reasonable,
   F rework the problem at least three times.
   C ompare it with known facts.
   H ess whether or not the answer looks correct.
   J use multiplication to solve.

Spiral Review

Divide. (Lesson 7-6)

1. 12 ÷ 2 ______ 6
2. 60 ÷ (−6) ______ −10
3. 24 ÷ (−6) ______ −4
4. −9 ÷ 3 ______ −3
5. 81 ÷ 9 ______ 9
6. 48 ÷ (−6) ______ −8
7. −35 ÷ 5 ______ −7
8. 64 ÷ 8 ______ 8
9. −21 ÷ (−7) ______ 3

ALGEBRA

10. Find the value of \( c ÷ d \) if \( c = −32 \) and \( d = 4 \).

\[ −8 \]

11. What value of \( m \) makes \( −9 ÷ m = −9 \) true?

\[ 1 \]
Enrich

Explore Adding Integers

A magic square is a square of numbers in which each row, column, and diagonal has the same sum.

Use counters to find if each is a magic square. If so, give the magic sum.

1. | -4 | 10 | 0 |
   | -6 | 2  | -2 |
   | 4  | 6  | -8 |

Magic Square: Yes or No? No

Magic Square: Yes or No?

2. | -7 | -12 | -11 |
   | -14 | -10 | -6  |
   | -9  | -8  | -13 |

Yes; sum is -30.

Use counters to complete these magic squares.

3. | 7  | -7  | -6  | 4  |
   | -4 | 2   | 1   | -1 |
   | 0  | -2  | -3  | 3  |
   | -5 | 5   | 6   | -8 |

Sum: -2

Sum of the four middle squares: 2

Sum of the four corners: -2

4. | 6  | -7  | -8  | 3  |
   | -5 | 0   | 1   | -2 |
   | -1 | -4  | -3  | 2  |
   | -6 | 5   | 4   | -9 |

Sum: -6

Sum of the four middle squares: 6

Sum of the four corners: 6

The Coordinate Plane

This is a coordinate plane. The horizontal number line is the $x$-axis, and the vertical number line is the $y$-axis. The two axes divide the plane into four quadrants, numbered I, II, III, IV.

Point $P$ shown on the graph is named by ordered pair $(-4, 3)$. To graph, or plot, point $P$, begin at the origin and count 4 spaces to the left. Then count up 3 spaces.

The ordered pair gives the coordinates of point $P$.

Use the graph above. Write the ordered pair that names each point.

1. $A (-2, 1)$  
2. $B (-6, -2)$  
3. $C (7, -4)$  
4. $D (3, 2)$  
5. $E (-10, 3)$  
6. $F (1, 4)$  
7. $G (-3, 3)$  
8. $H (3, -3)$  
9. $I (-8, 4)$  
10. $J (-10, -4)$  
11. $K (9, -2)$  
12. $L (9, 2)$
Write the ordered pair that names each point.

1. A (3, –4)  
2. B (–3, 7)  
3. C (–3, –5)  
4. D (–7, –4)  
5. E (6, 1)  
6. F (–3, 4)  

Use the coordinate plane at the right. Identify the point for each ordered pair.

7. (3, 0) G  
8. (–3, 0) H  
9. (–2, –4) K  
10. (2, –7) M  
11. (1, 4) L  
12. (–2, 5) J  

Solve.

13. Ann uses the equation \(y = x + 5\) to track a flock of migratory blue birds. Will the birds pass through the point (–1, –4)? Explain.

No; \(-1 + 5 = 4\), so they will pass through the point (–1, 4).

14. An ant was located at the point (2, 3). It crawled down vertically 4 units, and turned to its right and crawled horizontally for 7 units. At what coordinates is the ant now?

\((-5, -1)\)
1. What are the coordinates of the pirate ship? In which quadrant is it located?

(-3, 3), quadrant II

2. What is located at the ordered pair (-2.5, -3.5)?

forest

3. Begin at the lookout tower. Travel east 7 units and north 4 units. Where are you?

buried treasure

4. Which is the farthest south: the buried treasure, the mountain, or the parrot?

parrot

---

5. What is located at the ordered pair (2.5, 3.5)?

forest

6. South Pole (90°S, 0°)

7. How many degrees of latitude separate Halifax, Nova Scotia (45°N, 65°W), and Cordoba, Argentina (32°S, 65°W)?

77°

8. How many degrees of longitude separate Baku (41°N, 50°E), and New Haven, CT (41°N, 73°W)?

123°

9. One degree of longitude at the equator is about 69.2 miles. How far is it from Quito, Ecuador (0°, 79°W) to Kampala, Uganda (0°, 32°E), to the nearest 10 miles?

7,720 mi

10. How far is it from Macapa, Brazil (0°, 51°W), to the nearest degree.

0°, 9°E
Solve each equation. Check your solution.

1. \( 9 + 16 = 25 \) 
2. \( m + 4 = 13 \) 
3. \( t - 9 = 8 \) 
4. \( e + 4 = 8 \) 
5. \( v = 4 \) 
6. \( s = 5 \) 

Solve:

7. \( f = 9 \) 
8. \( v = 24 \) 
9. \( z = 9 \) 
10. \( r = 7 \) 
11. \( s = 10 \) 
12. \( b = 11 \) 
13. \( n = 13 \)

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**Homework Practice**

**Solving Addition Equations**

Solve each equation. Check your solution.

1. \( y + 4 = 8 \)  
   \[ y = 4 \]

2. \( 10 = 5 + d \)  
   \[ d = 5 \]

3. \( x + 2 = -12 \)  
   \[ x = -14 \]

4. \( y + 7 = -16 \)  
   \[ y = -23 \]

5. \( x + 0 = -1 \)  
   \[ x = -1 \]

6. \( y + 3 = -8 \)  
   \[ y = -11 \]

7. \( y + 9 = 18 \)  
   \[ y = 9 \]

8. \( 0 = 5 + d \)  
   \[ d = -5 \]

9. \( x + \frac{3}{4} = \frac{3}{2} \)  
   \[ x = \frac{1}{4} \]

10. \( 5 + \frac{1}{2} = 5 + \frac{1}{2} \)  
    \[ 11 \]

11. \( x + 6 = -12 \)  
    \[ x = -18 \]

12. \( -10.1 = 7 + d \)  
    \[ d = -17.1 \]

13. \( y + 6.9 = 2.6 \)  
    \[ y = -4.3 \]

14. \( -3.9 = 2.3 + d \)  
    \[ d = -6.2 \]

15. \( x + 1.5 = 3 \)  
    \[ x = 1.5 \]

---

**Problem-Solving Practice**

**Solving Addition Equations**

Write an equation to solve.

1. Eugene’s football team scored 17 points in a football game, 6 of which Eugene scored. How many points did the rest of the team score?
   \[ 6 + S = 17; S = 11 \]

2. Dottie read her book on Wednesday and Thursday. If she read 27 pages on Wednesday and read 64 pages in all, how many pages did she read on Thursday?
   \[ 27 + p = 64; p = 37 \] pages

3. Margarita had to measure butter for a recipe. She did not want to measure it directly in a cup because some butter would stick to the side of it. She put \( 1 \frac{1}{2} \) cups cold water into a measuring cup and added butter until the level of the water read 2 cups. How much butter did she measure?
   \[ \frac{1}{2} \text{ cup} \]

4. Silas rode his bicycle 2.5 blocks to his friend’s house. From there, the two boys rode the rest of the way to school. If it is 8.7 blocks from Silas’s house to the school, how far is it from his friend’s house to the school?
   \[ 6.2 \text{ blocks} \]

5. Flora had saved a total of $24.85. She went to a department store and bought a pair of gloves and a hat that matched her winter coat. If the gloves cost $6.85 and she had $10.45 left over, what did the hat cost?
   \[ $7.55 \]

6. Diane’s parents bought three boxes of tiles to replace the old tiles on their kitchen floor. Each tile is one square foot, and there are 30 tiles to a box. The kitchen floor is 78 square feet. How many tiles will they have left over?
   \[ 12 \text{ tiles} \]
Explore Addition Equations

Solve each equation. Then write each letter above its number at the bottom of the page.

1. $15 + B = 23$ \( B = 8 \)
2. $S + 9 = 18$ \( S = 9 \)
3. $H + 8 = 24$ \( H = 16 \)
4. $S + 3 = 13$ \( S = 10 \)
5. $L + 6 = 18$ \( L = 12 \)
6. $E + 7 = 13$ \( E = 6 \)
7. $P + 9 = 27$ \( P = 18 \)
8. $T + 17 = 32$ \( T = 15 \)
9. $S + 26 = 40$ \( S = 14 \)
10. $N + 57 = 128$ \( N = 71 \)
11. $16 + O = 27$ \( O = 11 \)
12. $E + 516 = 741$ \( E = 225 \)
13. $H + 13 = 20$ \( H = 7 \)
14. $I + 424 = 623$ \( I = 199 \)
15. $15 + O = 34$ \( O = 19 \)
16. $39 + Y = 73$ \( Y = 34 \)
17. $E + 249 = 355$ \( E = 106 \)
18. $38 + T = 91$ \( T = 53 \)
19. $T + 55 = 72$ \( T = 17 \)
20. $49 + Y = 106$ \( Y = 57 \)
21. $I + 804 = 976$ \( I = 172 \)
22. $125 + C + 112$ \( C = 13 \)

What words of advice could you give to Pinocchio?

- Honest
- Kind
- Trustworthy
- Helpful
- Responsible

Reteach

Solving Subtraction Equations

You can use addition to solve subtraction equations.

Solve: $f - 2 = 13$

To find the value of $f$, add 2 to both sides of the equation.

\[
\begin{align*}
f - 2 & = 13 \\
+ 2 & = + 2 \\
f & = 15
\end{align*}
\]

Check your answer by substituting 15 for $f$ in the original equation.

\[
\begin{align*}
f & = 15 \\
15 - 2 & = 13
\end{align*}
\]

It checks.

Solve each equation. Check your solution.

1. $a - 7 = 10$ \( a = 17 \)
2. $j - 3 = 11$ \( j = 14 \)
3. $l - 9 = 1$ \( l = 10 \)
4. $p - 11 = -5$ \( p = 6 \)
5. $b - 9 = 6$ \( b = 15 \)
6. $g - 10 = -4$ \( g = 6 \)
7. $m - 7 = 12$ \( m = 19 \)
8. $i - 12 = 2$ \( i = 14 \)
9. $d - 2 = 8$ \( d = 10 \)
10. $k - 3 = 6$ \( k = 9 \)
11. $z - 2 = -1$ \( z = -9 \)
12. $r - 7 = -2$ \( r = 5 \)
13. $n - 4 = -11$ \( n = -7 \)
14. $y - 9 = 1$ \( y = 10 \)
15. $f - 2 = 1$ \( f = 3 \)
16. $q - 8 = 3$ \( q = 11 \)
17. $c - 15 = 5$ \( c = 20 \)
18. $h - 4 = -3$ \( h = 1 \)
### Skills Practice
#### Solving Subtraction Equations

Solve each equation. Check your solution.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( n - 4 = 9 )</td>
<td>( n = 13 )</td>
</tr>
<tr>
<td>2. ( d - 3 = 6 )</td>
<td>( d = 9 )</td>
</tr>
<tr>
<td>3. ( b - 7 = 3 )</td>
<td>( b = 10 )</td>
</tr>
<tr>
<td>4. ( r - 4 = 4 )</td>
<td>( r = 8 )</td>
</tr>
<tr>
<td>5. ( y - 8 = 14 )</td>
<td>( y = 22 )</td>
</tr>
<tr>
<td>6. ( s - 4 = -2 )</td>
<td>( s = 2 )</td>
</tr>
<tr>
<td>7. ( 9 = d - 6 )</td>
<td>( d = 15 )</td>
</tr>
<tr>
<td>8. ( m - 7 = 9 )</td>
<td>( m = 16 )</td>
</tr>
<tr>
<td>9. ( 3 = w - 7 )</td>
<td>( w = 10 )</td>
</tr>
<tr>
<td>10. ( 4 = z - 6 )</td>
<td>( z = 10 )</td>
</tr>
<tr>
<td>11. ( f - 3 = -12 )</td>
<td>( f = -9 )</td>
</tr>
<tr>
<td>12. ( -2 = t - 1 )</td>
<td>( t = -1 )</td>
</tr>
<tr>
<td>13. ( a - 10 = 4 )</td>
<td>( a = 14 )</td>
</tr>
<tr>
<td>14. ( v - 9 = 2 )</td>
<td>( v = 11 )</td>
</tr>
<tr>
<td>15. ( 5 = i - 3 )</td>
<td>( i = 8 )</td>
</tr>
<tr>
<td>16. ( a - 7 = 2 )</td>
<td>( a = 9 )</td>
</tr>
<tr>
<td>17. ( v - 10 = -2 )</td>
<td>( v = 8 )</td>
</tr>
<tr>
<td>18. ( -3 = n - 1 )</td>
<td>( n = -2 )</td>
</tr>
<tr>
<td>19. ( 7 = i - 6 )</td>
<td>( i = 13 )</td>
</tr>
<tr>
<td>20. ( -7 = r - 4 )</td>
<td>( r = -3 )</td>
</tr>
</tbody>
</table>

### Homework Practice
#### Solving Subtraction Equations

Solve each equation. Check your solution.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( y - 4 = 2 )</td>
<td>( y = 6 )</td>
</tr>
<tr>
<td>2. ( d - 5 = 0 )</td>
<td>( d = 5 )</td>
</tr>
<tr>
<td>3. ( d - 11 = 4 )</td>
<td>( d = 15 )</td>
</tr>
<tr>
<td>4. ( x - 8 = -3 )</td>
<td>( x = 5 )</td>
</tr>
<tr>
<td>5. ( y - 4 = -7 )</td>
<td>( y = -3 )</td>
</tr>
<tr>
<td>6. ( d - 13 \frac{1}{2} = -8 )</td>
<td>( d = 15 \frac{1}{2} )</td>
</tr>
<tr>
<td>7. ( -3 = d - 9 )</td>
<td>( d = 6 )</td>
</tr>
<tr>
<td>8. ( x - 6 = 1 )</td>
<td>( x = 7 )</td>
</tr>
<tr>
<td>9. ( y - \frac{1}{2} = 2 )</td>
<td>( y = \frac{5}{2} )</td>
</tr>
<tr>
<td>10. ( d - 7.5 = -10.8 )</td>
<td>( d = -3.3 )</td>
</tr>
<tr>
<td>11. ( x - 1.1 = 1.9 )</td>
<td>( x = 3 )</td>
</tr>
<tr>
<td>12. ( x - 4 = -3.5 )</td>
<td>( x = 0.5 )</td>
</tr>
</tbody>
</table>

### Spiral Review
#### (Lesson 7–9)

Solve each equation. Check your solution.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. ( y + 9 = 18 )</td>
<td>( y = 9 )</td>
</tr>
<tr>
<td>15. ( -24 = 1.1 + d )</td>
<td>( d = -22 )</td>
</tr>
<tr>
<td>16. ( t + \frac{1}{2} = 9 )</td>
<td>( t = 8 \frac{1}{2} )</td>
</tr>
<tr>
<td>17. ( -12 = -6 + d )</td>
<td>( d = 6 )</td>
</tr>
<tr>
<td>18. ( x + 10 = -12 )</td>
<td>( x = -22 )</td>
</tr>
<tr>
<td>19. ( m + -3 = 0 )</td>
<td>( m = 3 )</td>
</tr>
<tr>
<td>20. ( s + 1.5 = 3 )</td>
<td>( s = 1.5 )</td>
</tr>
<tr>
<td>21. ( 25 = 5 + d )</td>
<td>( d = 20 )</td>
</tr>
<tr>
<td>22. ( x + 7 = -14 )</td>
<td>( x = -21 )</td>
</tr>
</tbody>
</table>

### Solve

23. Usually, running burns 300 more calories per hour than swimming does. If Emily burns 400 calories per hour running, write and solve an addition equation to find how many calories Emily will burn swimming.

\[ 300 + x = 400; \quad 100 \text{ calories} \]
Problem-Solving Practice

Solving Subtraction Equations

Write an equation. Then solve.

1. Doug had 250 liters of soup to serve in the cafeteria. After lunch, 27 liters were left over. How much soup was served?

\[
250 - 27 = s \\
s = 223
\]

2. Alisa and other students write articles for the school newspaper. The next issue of the newspaper will contain 87 articles. Alisa finished writing all of her articles, and now there are 75 articles left for the other students to write. How many articles did Alisa write?

\[
87 - 75 = a \\
a = 12
\]

3. Ted has a choice of two summer camps, one of which is 26.7 miles from home and one that is 98.3 miles from home. How much farther is the second camp from Ted’s home?

\[
71.6 \text{ miles}
\]

4. Jaida and her sister shared a mushroom and pepperoni pizza. Jaida ate \( \frac{1}{2} \) of the pizza. After her sister had some, there was \( \frac{1}{6} \) of the pizza left. How much did her sister eat?

\[
\text{\frac{1}{3}} \text{ of the pizza}
\]

5. Rosanne wanted to compare the amount of electricity she used in the summer to the amount she used in the winter. The reading on her electric meter at the first of January was 1587 kWh (kilowatt-hour) and the reading at the first of February was 1746 kWh. How many kWh did she use in January?

\[159 \text{ kWh}
\]

The following summer, the reading at the first of July was 2047 kWh, and the reading at the first of August was 2238 kWh. How many kWh did she use in July?

\[191 \text{ kWh}
\]

How many more kWh did she use in July than in January?

\[32 \text{ kWh}
\]

Enrich

Addition and Subtraction Equations

Play this game with a partner. You will need counters, scissors, and a paper bag.

- Cut out the equations at the bottom of the page and put them in the paper bag.
- Draw an equation from the bag. Calculate the answer. If the answer is a whole number, move forward that many spaces. If the answer is a fraction or decimal, go back to START.
- The winner is the first player to reach 50 points. You may need to go around the game board several times before there is a winner.

The Equation Game

- Subtract 10 from your score.
- Go ahead 3 spaces.
- Lose a turn.
- Add your partner’s score to yours.

[Table with equations and actions]

- You earn 9 points.
- You earn 7 points.
- Take another turn.
- Add 2 to your score.
- You lose 2 points.
- You earn 8 points.

\[
\begin{align*}
\text{Start} & \\
x + 19 = 24 & y - 5 = 1 & b + \frac{1}{3} = 4\frac{1}{3} & c + 5.3 = 7.3 \\
\sigma + 14 = 18 & n - 1 = 3 & w - 2.8 = 0.2 & d - 0 = 5\frac{3}{4} \\
m + 7.5 = 8.5 & k - 3 = 3 & z + 11 = 11 & q - 2.9 = 1.1 \\
p - 2 = 5 & d + \frac{5}{6} = 5\frac{5}{6} & j + 1.8 = 2.2 & v + 1 = 7 \\
f - 2 = 1 & h + 4.6 = 6.4 & r - 5 = 0 & t - 1.3 = 0.7
\end{align*}
\]
### Solve each equation. Check your solution.

1. \(7w = 28\)  \(w = 4\)
2. \(6q = 108\)  \(q = 18\)
3. \(20d = 180\)  \(d = 9\)
4. \(6a = 12\)  \(a = 2\)
5. \(4e = 276\)  \(e = 69\)
6. \(15y = 48\)  \(y = 3.2\)
7. \(8k = 40\)  \(k = 5\)
8. \(0.4p = 16\)  \(p = 40\)
9. \(3j = 39\)  \(j = 13\)
10. \(12s = 60\)  \(s = 5\)
11. \(30h = 15\)  \(h = 0.5\) or \(\frac{1}{2}\)
12. \(8w = 64\)  \(w = 8\)
13. \(-3y = 12\)  \(y = -4\)
14. \(2.4c = 120\)  \(c = 50\)
15. \(10x = -20\)  \(x = -2\)
16. \(7s = 21\)  \(s = 3\)
17. \(4x = 12\)  \(x = 3\)
18. \(32f = 64\)  \(f = 0.2\)
19. \(0.6t = 60\)  \(t = 100\)
20. \(-4w = 24\)  \(w = -6\)

### Solve.

21. The Martinez family paid $37.50 for 5 movie passes. Write a multiplication equation to describe the situation. Solve it to find the cost in dollars, \(c\), of each movie pass.

\[5c = 37.50; c = 7.50\]

22. Three friends each bought a gift. Each of the presents cost the same amount. All together, they paid $15. Write a multiplication equation to describe the situation.

\[3f = 15; f = 5\]
Homework Practice
Solving Multiplication Equations

Solve each equation. Check your solution.

1. \(6b = 24\)  \(4\)  
2. \(-8m = -32\)  \(4\)  
3. \(49 = 7x\)  \(7\)  
4. \(2y = 10\)  \(5\)  
5. \(-1t = -12\)  \(12\)  
6. \(63 = 7x\)  \(9\)  
7. \(8a = 24\)  \(3\)  
8. \(-2s = -22\)  \(11\)  
9. \(54 = 6y\)  \(9\)  

Solve.

10. Maria painted flowers on 10 plates and earned $50. Write and solve an equation to find out how much she earned for each plate.

\(10x = 50; \ x = 5\)

Problem-Solving Practice
Solving Multiplication Equations

Write an equation. Then solve.

1. Samantha has 84 tomato plants in 12 rows. How many tomato plants are in each row?

\(12x = 84; \ 7 \text{ plants}\)

2. Calah cuts 16 pizzas into 128 total slices. Into how many slices will each pizza be cut?

\(16x = 128; \ 8 \text{ slices}\)

3. Olivia raises 12 chickens on her farm. If she gathers 240 eggs in 2 weeks, how many eggs did each chicken lay if they each laid the same number of eggs?

\(12x = 240; \ 20 \text{ eggs}\)

4. Juan works a total of 5 hours at his after-school job. If he earns $35, how much does he earn per hour?

\(5x = 35; \$7\)

5. Sophia has a large family. There are 48 people sitting at 6 tables. When they all get together for a holiday dinner, how many people are sitting at each table if there are the same number of people at each table?

\(6x = 48; \ 8 \text{ people}\)

6. Jacob likes to go on nature walks. On one of his walks, he noticed 8 different types of insects. His walk covered only 1 acre. If he walked and saw 32 insects, how many acres would he have walked?

\(8x = 32; \ 4 \text{ acres}\)

Solve each equation. Check your solution. (Lesson 7–10)

11. \(y - 4 = 2\)  \(6\)  
12. \(-4 = -11 - d\)  \(-7\)  
13. \(-45 - x = -4\)  \(-0.5\)  
14. \(x - 8 = -3\)  \(5\)  
15. \(y - 4 = -7\)  \(-3\)  
16. \(8\frac{1}{2} = 13\frac{1}{2} - d\)  \(5\)  
17. \(-5 = d - 10\)  \(5\)  
18. \(t - 9\frac{1}{2} = -4\frac{1}{2}\)  \(5\)  
19. \(-11 = -10.5 - d\)  \(-9.4\)  

Solve.

20. Joe is 3 inches shorter than his brother Jack. Jack is 60 inches tall. Write and solve an equation to find out how tall Joe is.

\(60 \ - \ x = 3; \ x = 57 \text{ inches}\)
Match each word to its definition. Write your answers on the lines provided.

1. coefficient
2. inverse operations
3. quadrants
4. zero pair
5. opposites
6. ordered pair
7. equation

A. A pair of counters that includes one positive counter and one negative counter.
B. Numbers that are the same distance from zero in opposite directions.
C. A pair of numbers that are the coordinates of a point in a coordinate plane or grid in this order (horizontal coordinate, vertical coordinate).
D. A mathematical sentence that contains an equal sign, =, indicating that the left side of the equal sign has the same value as the right side.
E. Operations that undo each other.
F. One of four sections of a coordinate graph formed by two axes.
G. The number by which \( x \) is multiplied in an equation like \( 3x = 12 \).
Oral Assessment

Use construction paper to make cards with the integers 5, 7, –3, –5, –2, 9, and –1.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. Which integer would be first if you put all of the integers in number order?  
   \[ -5 \]

2. Which integer would be last if you put all of the integers in number order?  
   \[ 9 \]

3. What is the order from least to greatest for all of the integers?  
   \[ -5, -3, -2, -1, 5, 7, 9 \]

4. Tell how you got your answer.  
   \[ \text{Answers will vary; Accept reasonable answers.} \]

5. If you added the integer –10 to the group of integers, where would it go in the number line?  
   \[ \text{left of } -5 \]

6. Tell how you got your answer.  
   \[ \text{Answers will vary; Accept reasonable answers.} \]

On Saturday morning, the temperature dropped 3 degrees each hour. If the temperature was 12°F before it started dropping, what was the temperature after 6 hours?

\[ -6°F \]

What was the temperature after 4 hours?

\[ 0°F \]

Tell how you got your answer.

\[ \text{Answers will vary; Accept reasonable answers.} \]

If the temperature was 15°F before it started dropping, what was the temperature after 6 hours?

\[ -3°F \]

What was the temperature after 4 hours?

\[ 3°F \]

Tell how you got your answer.

\[ \text{Answers will vary; Accept reasonable answers.} \]
Chapter 7 Assessment Answer Key

Chapter Diagnostic Assessment
Page 64

1. 12
2. 10
3. 12
4. 20
5. 13
6. 4
7. 4
8. 3
9. 24
10. 45
11. 6
12. 14

Chapter Pretest
Page 65

1. –9
2. 9
3. –75
4. 45
5. 7
6. –10
7. –7, –4, 2, 3
8. $0.25, $2.00
9. \( p = -7 \)
10. \( p = -11 \)
11. \( p = -18 \)
12. \( p = -5 \)
13. \( p = 13 \)

Quiz 1 (7–1 through 7–3)
Page 66

1. 7
2. –20
3. 6
4. –16
5. –1
6. <
7. >
8. 0, 1, 3, 20, 35
9. –67, –60, –40, 14, 20, 100
10. \(-2^\circ F\)

(continued on the next page)
Chapter 7 Assessment Answer Key

Quiz 2 (7–4 through 7–6)
Page 67

1.  
2.  
3.  
4.  
5.  
6.  
7.  
8.  

Quiz 3 (7–7 through 7–11)
Page 68

1.  
2.  
3.  
4.  
5.  
6.  
7.  

Mid-Chapter Review
(7–1 through 7–5)
Page 69

1.  
2.  
3.  
4.  
5.  
6.  
7.  

Sample answer:
8. 

9.  
10.  

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### Chapter 7 Assessment Answer Key

<table>
<thead>
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<th>Chapter Test, Form 2A</th>
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<td>Page 76</td>
</tr>
<tr>
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<td>11. C</td>
</tr>
<tr>
<td>2. J</td>
<td>12. G</td>
</tr>
<tr>
<td>3. B</td>
<td>13. A</td>
</tr>
<tr>
<td>5. B</td>
<td>15. B</td>
</tr>
<tr>
<td>7. B</td>
<td></td>
</tr>
<tr>
<td>8. F</td>
<td></td>
</tr>
<tr>
<td>9. A</td>
<td></td>
</tr>
<tr>
<td>10. G</td>
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<tbody>
<tr>
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<tr>
<td>1. C</td>
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<tr>
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<td>3. C</td>
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<td>4. F</td>
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<td>6. G</td>
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<tr>
<td>8. F</td>
</tr>
<tr>
<td>9. C</td>
</tr>
</tbody>
</table>

(continued on the next page)
Chapter 7 Assessment Answer Key

Chapter Test, Form 2A
Page 78

10. H

11. D

12. F

13. B

14. H

15. A

Chapter Test, Form 2B
Page 79

1. C

2. F

3. A

4. G

5. B

6. G

7. C

8. H

9. C

10. H

11. A

12. F

13. C

14. F

15. B

16. F

17. B

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<th>Chapter Test, Form 2D</th>
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<tr>
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<td>Page 82</td>
</tr>
<tr>
<td>1. $2$</td>
<td>17. 21,650 feet</td>
</tr>
<tr>
<td>2. $-21$</td>
<td></td>
</tr>
<tr>
<td>3. $0$</td>
<td></td>
</tr>
<tr>
<td>4. $-42$</td>
<td></td>
</tr>
<tr>
<td>3, 2, 1, -4,</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td></td>
</tr>
<tr>
<td>5. $-4, -3, 0, 1, 2$</td>
<td></td>
</tr>
<tr>
<td>6. $-8$</td>
<td></td>
</tr>
<tr>
<td>7. $7$</td>
<td></td>
</tr>
<tr>
<td>8. $25$</td>
<td></td>
</tr>
<tr>
<td>9. $7$</td>
<td></td>
</tr>
<tr>
<td>10. $-16$</td>
<td></td>
</tr>
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<td>11. $21$-yard line</td>
<td></td>
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<tr>
<td>12. $-3$</td>
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</tr>
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<td>13. $6$</td>
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<td></td>
</tr>
<tr>
<td>15. $8$</td>
<td></td>
</tr>
<tr>
<td>16. 21-yard line</td>
<td></td>
</tr>
<tr>
<td>17. 21,650 feet</td>
<td></td>
</tr>
<tr>
<td>18. ($-1, -1$)</td>
<td></td>
</tr>
<tr>
<td>19. $H$</td>
<td></td>
</tr>
<tr>
<td>20. (0, 0)</td>
<td></td>
</tr>
<tr>
<td>21. 21-yard line</td>
<td></td>
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<tr>
<td>22. 21,650 feet</td>
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</tr>
<tr>
<td>23. -$16$</td>
<td></td>
</tr>
<tr>
<td>24. $-8$</td>
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<td>25. $7$</td>
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<td>26. $25$</td>
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<td>27. $7$</td>
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<tr>
<td>28. $-2$</td>
<td></td>
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<td>29. $-21$</td>
<td></td>
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<td>30. $0$</td>
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<tr>
<td>31. $-42$</td>
<td></td>
</tr>
<tr>
<td>32. 3, 2, 1, -4, -6</td>
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<tr>
<td>33. -$4, -3, 0, 1, 2$</td>
<td></td>
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<tr>
<td>34. $-20$</td>
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<td>35. $6$</td>
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(continued on the next page)
# Chapter 7 Assessment Answer Key

## Chapter Test, Form 2D

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>16.</td>
<td>-4</td>
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<tr>
<td>17.</td>
<td>9</td>
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</tbody>
</table>

## Chapter Test, Form 3

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<tr>
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<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>41</td>
</tr>
<tr>
<td>2.</td>
<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>-38</td>
</tr>
<tr>
<td>5.</td>
<td>-13</td>
</tr>
<tr>
<td>6.</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>36</td>
</tr>
<tr>
<td>8.</td>
<td>-21</td>
</tr>
<tr>
<td>9.</td>
<td>21,650 feet</td>
</tr>
<tr>
<td>10.</td>
<td>3, 2, 1, -4, -6</td>
</tr>
<tr>
<td>11.</td>
<td>-4, -3, 0, 1, 2</td>
</tr>
<tr>
<td>12.</td>
<td>$17</td>
</tr>
<tr>
<td>13.</td>
<td>21-yard line</td>
</tr>
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## Pages 85-86

<table>
<thead>
<tr>
<th>Question</th>
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</thead>
<tbody>
<tr>
<td>14.</td>
<td>5.8</td>
</tr>
<tr>
<td>15.</td>
<td>15</td>
</tr>
<tr>
<td>16.</td>
<td>-27</td>
</tr>
<tr>
<td>17.</td>
<td>1</td>
</tr>
<tr>
<td>18.</td>
<td>(-1, -1)</td>
</tr>
<tr>
<td>19.</td>
<td>(0, 0)</td>
</tr>
<tr>
<td>19.</td>
<td>(-1, -1)</td>
</tr>
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</table>

Check students’ work.
<table>
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<tr>
<th>Level</th>
<th>Specific Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</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>3</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>2</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>1</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>0</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 7 Assessment Answer Key
Page 87, Extended-Response Test
Sample Answers

In addition to the scoring rubric found on page A37, the following sample answers may be used as guidance in evaluating open-ended assessment items.

1. a. A zero pair is a pair of counters, one positive and one negative. Opposite integers are integers that are equal in number but different in sign, such as \(-4\) and \(+4\). A zero pair is similar to opposite integers because when you add them, they equal zero. For example, one positive counter plus one negative counter equals zero, and \(-4 + 4 = 0\).

b. Suppose you want to find \(-7 + 4\). Using the counter method, you would place 7 negative counters on the table and 4 positive counters on the table. Remove as many zero pairs as possible. Count the number of counters that are left. There are 3 negative counters, so the answer is \(-3\).

c. To find \(-7 + 4\) using a number line, start at 0 on the number line. Move 7 units to the left to show \(-7\). From there, move 4 units to the right to show \(+4\). You end up at \(-3\).

d. To subtract an integer, add its opposite. Suppose you want to find \(-8 - (-2)\). Using opposites, you would add the opposite of \(-2\), which is 2, so \(-8 - (-2) = -8 + 2 = -6\).

2. a. The answer will be negative because the product of two integers with different signs is always negative.

   b. The answer will be positive because the product of two integers with the same sign is always positive.

   c. The answer will be negative because the quotient of two integers with different signs is always negative.

   d. The answer will be positive because the quotient of two integers with the same sign is always positive.

3. To graph S(5, \(-1\)), start at the origin. Move 5 units right and 1 unit down. Plot your point. To graph T(\(-4, 3\)), start at the origin. Move to the left 4 units and up 3 units. Plot your point. To graph U(\(-2, -2\)) start at the origin. Move left 2 units and down 2 units. Plot your point.

4. a. To solve the problem, use the equation \(-15 + t = 3\). Add 15 to each side of the equation to undo the subtraction of 15 on the left side of the equation: \(-15 + t + 15 = 3 + 15\). The answer is \(t = 18\). The temperature rose 18°F.

   b. To solve this problem, use the formula for the area of a rectangle to write the equation \(78w = 2,808\). To solve the equation, divide each side by \(78\): \(\frac{78}{78}w = \frac{2,808}{78}\). The answer is \(w = 36\). The width of the tennis court is 36 feet.
### Chapter 7 Assessment Answer Key

#### Cummulative Standardized Test Practice

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<td>6. <strong>F</strong></td>
<td>11. $&lt;$</td>
</tr>
<tr>
<td>2. <strong>J</strong></td>
<td>7. <strong>A</strong></td>
<td>12. $&lt;$</td>
</tr>
<tr>
<td>3. <strong>B</strong></td>
<td>7. <strong>F</strong></td>
<td>13. <strong>4</strong></td>
</tr>
<tr>
<td>5. <strong>A</strong></td>
<td>10. $45 - 58 = -13$</td>
<td>15. <strong>to the right</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>16. $-12$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17. <strong>3</strong></td>
</tr>
</tbody>
</table>