LESSON 1-6

## Ready to Go On? Problem Solving Intervention

### *Multiplying and Dividing Integers*

You can multiply and divide integers to solve some problems.

Last week the daily high temperature in Chillburn was −7°F for the first 3 days and −4°F for next 2 days. On Saturday it was 0°F and on Sunday 1°F. What was the mean daily high temperature for the week?

**Understand the Problem**

1. How do you find the mean of a set of data values?

   Find the sum of the data values and divide by the number of values in the set.

2. How many data values are in the set in the problem? 7

**Make a Plan**

3. What two integers can you multiply to find the sum for the first 3 days? 3 and −7

4. Write an expression with multiplication for the sum of the 7 data values. $3 \cdot (-7) + 2 \cdot (-4) + 0 + 1$

**Solve**

5. Evaluate the expression you wrote in Exercise 4 to find the sum of the 7 daily high temperatures.

   $3 \cdot (-7) + 2 \cdot (-4) + 0 + 1 = -21 + (-8) + 1 = -28$

6. Write and evaluate a numerical expression to find the mean daily high temperature for the week.

   $\frac{-28}{7} = -4$; The mean daily high temperature for the week was −4°F.

**Check**

7. Explain why your answer is reasonable.

   Possible answer: The daily high was a little below −4°F for a few days and a little above −4°F for a few days.

**Solve**

8. Suppose the temperature for Saturday was incorrect. If the mean daily high temperature for the week were actually −3°F, what was the correct high temperature on Saturday? 7°F

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SECTION 1A

## Ready to Go On? Quiz

### 1-1 Variables and Expressions

**Evaluate each expression for the given values of the variables.**

1. $9x + 2y$ for $x = 3$ and $y = 1$ — 29
2. $7(a - 3b)$ for $a = 23$ and $b = 7$ — 14
3. $3(g - h) + 3$ for $g = 5$ and $h = 4.5$ — 4.5
4. $8m \div n$ for $m = 9$ and $n = 2$ — 36

### 1-2 Algebraic Expressions

**Write an algebraic expression for each word phrase.**

5. 5 minus the product of $x$ and 3 — $5 - 3x$
6. one-fourth the sum of 8 and $y$ — $\frac{1}{4}(8 + y)$

**Write a word phrase for each algebraic expression.**

7. $6a - 4$ — 4 less than the product of 6 and $a$
8. $8(p + 9)$ — 8 times the sum of $p$ and 9

### 1-3 Integers and Absolute Value

**Write the integers in order from least to greatest.**

9. −35, 4, −8, 25 — −35, −8, 4, 25
10. 15, −9, −16, 2 — −16, −9, 2, 15
11. −27, 31, 0, −28 — −28, −27, 0, 31
12. 8, −6, −5, 7 — −6, −5, 7, 8

**Evaluate each expression.**

13. $|-43| + |24|$ — 67
14. $|-16| - |13|$ — 3
15. $|6 + 10|$ — 16
16. $|63 - 55|$ — 8

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SECTION 1A

## Ready to Go On? Quiz continued

### 1-4 Adding Integers

**Evaluate each expression for the given value of the variable.**

18. $p + 7$ for $p = -12$ — −5
19. $w + (-2)$ for $w = 2$ — 0
20. $t + (-25)$ for $t = -2$ — −27
21. $10 + x$ for $x = -5$ — 5
22. One winter morning, the temperature was −5°F. By the afternoon, the temperature had increased 20°F. What was the temperature in the afternoon? 15°F

### 1-5 Subtracting Integers

**Subtract.**

23. $9 - (-3)$ — 12
24. $-13 - (-17)$ — 4
25. $-6 - 1$ — −7
26. $0 - 30$ — −30
27. A submarine was traveling at a depth of −200 feet below sea level. It then rose to a depth of −100 feet below sea level. What is the difference of the two depths? 100 ft

### 1-6 Multiplying and Dividing Integers

**Multiply or divide.**

28. $\frac{-42}{7}$ — −6
29. $-3(-6)$ — 18
30. $8(-6)(2)$ — −96
31. $\frac{-80}{-20}$ — 4
32. During eight plays in the game, Carlo's football team had 3 gains of 6 yards each and 5 losses of 4 yards each. What was his team's total yards for those eight plays? −2 yards

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SECTION 1A

## Ready to Go On? Enrichment

### *Evaluating Algebraic Expressions with More Than Two Variables*

There is no limit to the number of variables in an algebraic expression. Follow the same steps you would use to solve an algebraic expression with only two variables. Substitute all the values for the variables first, then simplify the expression.

**Evaluate the expression for the given values of the variables.**

$4xyz + 2x$
for $x = 2$, $y = 6$, and $z = 3$

| | |
|---|---|
| $4(2)(6)(3) + 2(2)$ | Substitute the values for the variables. |
| $144 + 4$ | Simplify using the Order of Operations. |
| 148 | |

**Evaluate the expression for the given values of the variables**

1. $w(8) + 4me$ for $w = 2$, $m = 5$, and $e = -2$ — −24
2. $2books/1book$ for $b = 2$, $o = 4$, $k = -5$, and $s = -2$ — −4
3. $\frac{1}{2}(time)$ for $t = 2$, $i = 5$, $m = -3$, $e = -1$ — 15
4. $nine + one$ for $n = -1$, $i = 2$, $e = 10$, and $o = 1$ — 10
5. $ur + 2cool$ for $u = -2$, $r = 5$, $c = 2$, $o = -10$, and $l = 3$ — 1,190
6. $now + u + try + it$ for $n = 2$, $o = 5$, $w = -6$, $u = -4$, $t = -7$, $r = -2$, $y = -1$, and $i = 9$ — −141
7. Make up your own algebraic expression with more than two variables. Assign each variable a value and give it to friend to solve.

   Answers will vary.

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## LESSON 1-9 Ready to Go On? Skills Intervention
### *Introduction to Inequalities*

An **inequality** is a type of math sentence that uses the symbols $<$, $>$, $\leq$, or $\geq$. An **algebraic inequality** is an inequality containing a variable. The solution of an inequality is a **solution set** which can be shown on a number line.

**Vocabulary**
inequality
algebraic inequality
solution set

**Completing an Inequality**
Use $<$ or $>$ to complete the inequality.

$15 + 6$ [?] 25

21 [?] 25 — What is the sum of 15 and 6?

21 [<] 25 — Insert the correct inequality sign.

**Solving and Graphing Inequalities**
Solve and graph each inequality.

**A.** $m - 12 > 8$

$m - 12 > 8$

$+12 \quad +12$ — What number do you add to both sides?

$m > 20$ — What is the sum?




Should the graph have an open or closed circle? open

Should you draw the arrow on the graph to the left or right? right

**B.** $\frac{a}{4} < 7$

$4 \cdot \frac{a}{4} < 7 \cdot 4$ — By what number do you multiply by both sides?

$a < 28$ — What is the product?




Should the graph have an open or closed circle? open

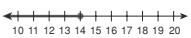
Should you draw the arrow on the graph to the left or right? left

**C.** $b + 18 \leq 32$

$b + 18 \leq 32$

$-18 \quad -18$ — What number do you subtract from both sides?

$b \leq 14$ — Subtract.




Should the graph have an open or closed circle? closed

Should you draw the arrow on the graph to the left or right? left

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## LESSON 1-9 Ready to Go On? Problem Solving Intervention
### *Introduction to Inequalities*

You can solve some problems by writing an inequality to model the situation.

Paul used part of his gift money to buy an exercise machine. The sale advertisement stated that you make 4 payments of $20 each plus a one-time shipping and handling fee of $7. Write and solve an inequality to find the least amount of gift money that Paul could have had.

**Understand the Problem**

**1.** What can you say about the cost of the exercise machine compared to Paul's gift money?

The exercise machine costs less than all of Paul's gift money.

**Make a Plan**

**2.** What information will you use to find the cost of the exercise machine?

4 payments of $20 each plus a one-time charge of $7.

**Solve**

**3.** Write a numerical expression for the cost of the exercise machine.

$4(20) + 7$

**4.** Write an inequality to show the relationship between Paul's gift money $x$ and the cost of the exercise machine.

$4(20) + 7 < x$

**5.** Solve your inequality. Use the solution to answer the question in the problem.

$x > 87$; Paul's gift money was more than $87.

**Check**

**6.** Check your solution by showing that a little more than $87 is a solution to the inequality and that a little less than $87 is not a solution.

$4(20) + 7 < (88)$; $87 < 88$ is true, so, 88 is a solution;

$4(20) + 7 < (86)$; $87 < 86$ is not true, so 86 is not a solution; 87 is reasonable.

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## SECTION 1B Ready to Go On? Quiz

### 1-7 Solving Equations by Adding or Subtracting
**Solve.**

**1.** $x + (-12) = -3$ — $x = 9$

**2.** $t - (-8) = 16$ — $t = 8$

**3.** $-42 + p = 7$ — $p = 49$

**4.** $w + 15 = -3$ — $w = -18$

**5.** $31 + k = 12$ — $k = -19$

**6.** $y - 4 = 10$ — $y = 14$

**7.** $h + (-7) = 29$ — $h = 36$

**8.** $z + 21 = -3$ — $z = -24$

**9.** $-9 + q = 0$ — $q = 9$

**10.** $b - 13 = -14$ — $b = -1$

**11.** $v - 56 = 19$ — $v = 75$

**12.** $d - 10 = -20$ — $d = -10$

**13.** Gabriela is saving money to buy a CD player that costs $42. She already has $17. How much more does she need to save to buy the CD player?

$25

**14.** Lawrence was listening to a morning weather report on the radio, but he missed the first part of the forecast. The announcer said that the temperature will drop 17 degrees by the afternoon to make it −12°F. What was the temperature in the morning?

5°F

### 1-8 Solving Equations by Multiplying or Dividing
**Solve.**

**15.** $\frac{r}{12} = -3$ — $r = -36$

**16.** $9d = 99$ — $d = 11$

**17.** $\frac{8}{-20} = 10$ — $g = -200$

**18.** $7w = 84$ — $w = 12$

**19.** $32c = -32$ — $c = -1$

**20.** $8x = 0$ — $x = 0$

**21.** $-16b = -48$ — $b = 3$

**22.** $\frac{96}{n} = -16$ — $n = -6$

**23.** $\frac{k}{-300} = -10$ — $k = 3{,}000$

**24.** $8f = -64$ — $f = -8$

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## SECTION 1B Ready to Go On? Quiz continued

### 1-8 Solving Equations by Multiplying or Dividing (continued)

**25.** Chelsea has 21 hair ribbons. This is 3 times as many hair ribbons as Gloria has. How many hair ribbons does Gloria have?

7 ribbons

**26.** A baseball card shop has 212 rookie cards in a display case. The rookie cards make up $\frac{1}{3}$ of the total baseball cards on display. What is the total number of baseball cards the shop has on display?

636 cards

### 1-9 Introduction to Inequalities
**Solve.**

**27.** $q + 72 \geq 32$ — $q \geq -40$

**28.** $y + 8 < 10$ — $y < 2$

**29.** $30 + r > -19$ — $r > -49$

**30.** $p - 5 \leq 31$ — $p \leq 36$

**31.** $c - 9 \geq 6$ — $c \geq 15$

**32.** $-5 + f \leq -6$ — $f \leq -1$

**33.** $x + 25 > 25$ — $x > 0$

**34.** $98 + b < 39$ — $b < -59$

**35.** $z - 480 > 1$ — $z > 481$

**36.** $t - 24 \leq 24$ — $t \leq 48$

**37.** $-37 + v \geq 0$ — $v \geq 37$

**38.** $k + 8 > 3$ — $k > -5$

**39.** To maintain her bowling average, Nola needs to bowl two games with a total score of at least 232. She scored a 127 in the first game. What is the lowest score Nola could have in the second game and still maintain her average?

105

**40.** Vince can't charge more than $200 on his credit card. He already charged $130 on his credit card to get his car fixed. What is the most Vince can charge on his credit card now?

$70

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