

## • Missing Numbers in Subtraction

### Power Up

#### facts

Power Up B

#### count aloud

Count by 25¢ from 25¢ to \$3.00 and from \$3.00 to 25¢. Count by 50¢ to \$5.00 and from \$5.00 to 50¢.

#### mental math

- Addition:**  $2500 + 500$
- Subtraction:**  $2500 - 500$
- Measurement:** Thuy ran 390 meters. Then he ran 450 meters. What is the total distance Thuy ran?
- Money:**  $\$7.50 + \$2.50$
- Number Sense:**  $10 + 10 - 5 + 10 - 5$
- Money:** How much money is 3 quarters? ... 4 quarters? ... 5 quarters?
- Measurement:** One foot is 12 inches. Two feet is 24 inches. How many inches is 3 feet?
- Geometry:** If a square is 5 inches on each side, what is the distance around the square?

#### problem solving

Choose an appropriate problem-solving strategy to solve this problem. Copy this addition problem and fill in the missing digits:

$$\begin{array}{r} 52\_ \\ + \_94 \\ \hline \_0\_2 \end{array}$$

## New Concept

### Thinking Skill

#### Verify

Why can these problems be read in opposite directions?

The numbers in an addition fact can be read in reverse direction to form a subtraction fact.

<b>Reading Down</b>	↓	3	↑	<b>Reading Up</b>
Three plus four		+ 4		Seven minus
is seven.		<u>7</u>		four is three.

Likewise, the numbers in a subtraction fact can be read in reverse direction to form an addition fact.

<b>Reading Down</b>	↓	9	↑	<b>Reading Up</b>
Nine minus		- 5		Four plus
five is four.		<u>4</u>		five is nine.

### Example 1

Reverse the order of these numbers to make an addition equation:

$$68 - 45 = 23$$

We write the numbers in reverse order.

$$23 \quad 45 \quad 68$$

Then we insert a plus sign and an equal sign to make an equation.

$$23 + 45 = 68$$

### Example 2

Reverse the order of these numbers to make an addition equation:

$$\begin{array}{r} 77 \\ - 23 \\ \hline 54 \end{array}$$

We write the numbers in reverse order, using a plus sign instead of a minus sign.

$$\begin{array}{r} 54 \\ + 23 \\ \hline 77 \end{array}$$

In this lesson we will practice finding missing numbers in subtraction problems. There are three numbers in a subtraction problem. Any one of the three numbers may be missing. Sometimes changing a subtraction problem to an addition problem can help us find the missing number.

### Example 3

Find the missing number:

$$\begin{array}{r} f \\ - 15 \\ \hline 24 \end{array}$$

We need to find the first number in this subtraction problem. When 15 is subtracted from  $f$ , the difference is 24. So  $f$  must be more than 24. We will read this subtraction problem in reverse direction to form an addition problem.

<b>Reading Down</b>	↓	$f$	↑	<b>Reading Up</b>
$f$ minus fifteen		$- 15$		Twenty-four
is twenty-four.		$\hline 24$		plus fifteen is $f$ .

Reading up, we see that 24 plus 15 is  $f$ . This means we can find  $f$  by adding 24 and 15.

$$\begin{array}{r} 24 \\ + 15 \\ \hline 39 \end{array}$$

We find that  $f$  is **39**. To check our work, we replace  $f$  with 39 in the original problem.

Replace  $f$  with 39.

$f$	→	39
$- 15$		$- 15$
$\hline 24$		$\hline 24$

This is correct.

From the previous example, we know the following:

$f$ ←	The first number of a subtraction problem can be found by adding the other two numbers.
$\begin{array}{r} - s \\ \hline t \end{array}$	

### Example 4

Find the missing number:

$$\begin{array}{r} 45 \\ - s \\ \hline 21 \end{array}$$

We need to find the second number in this subtraction problem. When  $s$  is subtracted from 45, the difference is 21. We know  $s$  must be less than 45. We will read this problem in both directions.

<b>Reading Down</b>	↓	45	↑	<b>Reading Up</b>
Forty-five minus $s$		$- s$		Twenty-one plus
is twenty-one.		$\hline 21$		$s$ is forty-five.

Reading up, we see that 21 plus  $s$  is 45. When the problem is read this way,  $s$  is a missing addend. We find a missing addend by subtracting.

$$\begin{array}{r} 45 \\ - 21 \\ \hline 24 \end{array}$$

We find that  **$s$  is 24**. Now we replace  $s$  with 24 in the original problem to check the answer.

Replace  $s$  with 24.

$$\begin{array}{r} 45 \\ - s \\ \hline 21 \end{array} \longrightarrow \begin{array}{r} 45 \\ - 24 \\ \hline 21 \end{array} \text{ This is correct.}$$

Here is another fact to remember for finding missing numbers in subtraction problems:

$\begin{array}{r} f \\ - s \\ \hline t \end{array}$	<p>The second or third number of a subtraction problem can be found by subtracting.</p>
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### Example 5

**Five years from now, Kendall's grandfather will be 60 years old. Which equation can be used to find the grandfather's age in years now?**

$$a + 5 = 60$$

$$a - 5 = 60$$

$$60 + 5 = a$$

We know that Kendall's grandfather is less than 60 years old. We need to solve each problem to find which answer is reasonable.

For the first equation, we find the missing addend by subtracting.

$$60 - 5 = 55$$

For the second equation, we reverse the order of the numbers to change a subtraction equation to an addition equation.

$$60 + 5 = 65$$

For the third equation, we add to find the sum.

$$60 + 5 = 65$$

The **first equation** is correct because 55 is less than 60.

## Lesson Practice

Reverse the order of the numbers to change each subtraction equation to an addition equation:

a.  $34 - 12 = 22$

b. 
$$\begin{array}{r} 56 \\ - 29 \\ \hline 27 \end{array}$$

Find the missing number in each subtraction problem:

c.  $w - 8 = 6$

d.  $23 - y = 17$

e. 
$$\begin{array}{r} n \\ - 24 \\ \hline 48 \end{array}$$

f. 
$$\begin{array}{r} 63 \\ - p \\ \hline 20 \end{array}$$

g. 
$$\begin{array}{r} q \\ - 36 \\ \hline 14 \end{array}$$

h. 
$$\begin{array}{r} 42 \\ - r \\ \hline 24 \end{array}$$

## Written Practice

*Distributed and Integrated*

- 1. Represent** Draw a number line marked with integers from  $-5$  to  $5$ .  
(12) How many unit segments are there from  $1$  to  $5$ ?
- 2. Represent** Use words to name  $\$4.48$ .  
(5)
- 3. Represent** Use digits to write eight hundred eighteen thousand,  
(7) eighty.
- 4.** John used tally marks to keep track of the number of votes each  
(12) candidate received. The winner received  $11$  votes. Use tally marks to show the number  $11$ .

**Formulate** For problems **5** and **6**, write an equation and find the answer.

- \*5.** Janet is reading a  $260$ -page book. She has read  $85$  pages. How many  
(11) more pages does she have left to read?
- 6.** Esmerelda mixed  $32$  ounces of soda with  $24$  ounces of juice to make  
(11) punch. How many ounces of punch did she make?

7. **Represent** Write this comparison using digits and a comparison symbol:

*Fifty-six is less than sixty-five.*

- \*8. **Analyze** Write the greatest three-digit even number that contains the digits 1, 2, and 3.

9. 
$$\begin{array}{r} \$43.10 \\ - \$ 1.54 \\ \hline \end{array}$$

10. 
$$\begin{array}{r} \$3.01 \\ - \$1.03 \\ \hline \end{array}$$

11. 
$$\begin{array}{r} 600 \\ - m \\ \hline 364 \end{array}$$

12. 
$$\begin{array}{r} 4625 \\ - 1387 \\ \hline \end{array}$$

13. 
$$\begin{array}{r} \$3.67 \\ \$4.12 \\ + \$5.01 \\ \hline \end{array}$$

14. 
$$\begin{array}{r} \$573 \\ \$ 96 \\ + \$427 \\ \hline \end{array}$$

15. 
$$\begin{array}{r} 68 \\ 532 \\ + 176 \\ \hline \end{array}$$

16. 
$$\begin{array}{r} 436 \\ + y \\ \hline 634 \end{array}$$

17.  $100 - n = 48$

18.  $\$31.40 - \$13.40$

19.  $6 + 48 + 9 + w = 100$

20.  $3714 + 56 + 459$

21. **Connect** Reverse the order of the numbers to change this subtraction equation to an addition equation:

$$50 - 18 = 32$$

- \*22. **Conclude** This sequence counts down by threes. What are the next six terms in the sequence?

12, 9, 6, ...


23. **Connect** Write two addition facts and two subtraction facts for the fact family 2, 8, and 10.

24. 
$$\begin{array}{r} n \\ - 17 \\ \hline 12 \end{array}$$

25. 
$$\begin{array}{r} p \\ - 175 \\ \hline 125 \end{array}$$

26. **Connect** Change this addition problem to a multiplication problem:

$$10 + 10 + 10 + 10$$

- \* 27.**  **Estimate** In a class of 23 students, there are 12 girls. Do girls make up more than or less than half the class? Explain your reasoning.

- \* 28.** Draw a horizontal segment and a vertical ray.

- 29.** Some word problems about combining have more than two addends. The word problem below has four addends. Answer the question in this problem:

*The football team scored 6 points in the first quarter, 13 points in the second quarter, 7 points in the third quarter, and 6 points in the fourth quarter. How many points did the team score in all four quarters?*

- 30.** **Formulate** Grace has \$7.00 in her wallet and \$4.37 in a coin jar. Use this information to write a word problem about combining, and answer the question in your problem.

## Early Finishers

*Real-World Connection*

Ethan had a collection of arrowheads. He gave Rachel 17 arrowheads. Ethan now has 56 arrowheads in his collection. Write a subtraction equation that can be used to find the number of arrowheads Ethan had before he gave some away. Solve the problem and explain how to check the answer.