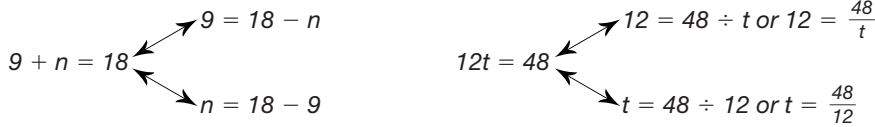


# 1-8 Solving Equations Using Inverse Operations (Pages 41–45)

You can use **inverse operations** to solve equations. Inverse operations undo each other. For example, to undo addition, you subtract. To undo multiplication, you divide. Inverse operations can be shown using related sentences.



Using an equation to solve a problem is an important problem-solving strategy. When you write an equation, the first step is to choose a variable and a quantity for the variable to represent. This is called **defining a variable**.

## EXAMPLES

**A** Solve the equation  $q + 14 = 45$ .

$$q + 14 = 45$$

$$q = 45 - 14 \quad \text{Write a related subtraction sentence.}$$

$$q = 31$$

**B** The sum of 456 and a number is equal to 804. Find the number.

Let  $n$  represent the number. Then translate the words into an equation using the variable.

$$\underbrace{456}_{\text{plus}} \underbrace{\text{number}}_n \underbrace{\text{equals}}_= \underbrace{804}$$

$$456 + n = 804$$

$$n = 804 - 456 \quad \text{Write a related subtraction sentence.}$$

$$n = 348$$

## PRACTICE

**Solve each equation using the inverse operation. Use a calculator when needed.**

- |                      |                  |                    |                    |
|----------------------|------------------|--------------------|--------------------|
| 1. $25x = 175$       | 2. $m + 18 = 23$ | 3. $132 = 11n$     | 4. $7 + n = 33$    |
| 5. $13 = 31 - k$     | 6. $5.2 = 1.3x$  | 7. $f + 11.4 = 14$ | 8. $112 = 14p$     |
| 9. $8.31 - n = 4.06$ | 10. $11n = 121$  | 11. $x + 4 = 17$   | 12. $q \div 4 = 5$ |

**Translate each sentence into an equation. Then solve.**

13. When a number is reduced by 6 the result is 13.  
 14. A number divided by 3 is 12.                      15. Four times a number is 28.



**16. Standardized Test Practice** The high school chorus held a spaghetti dinner to raise money. The food served cost \$342.82. The drinks served cost \$82.71. If \$580.00 was collected from ticket sales, how much profit was made?

- A** \$1,005.53                      **B** \$425.53                      **C** \$237.18                      **D** \$154.47

Answers: 1. 7   2. 5   3. 12   4. 26   5. 18   6. 4   7. 2.6   8. 8   9. 4.25   10. 11   11. 11   12. 20   13.  $n - 6 = 13$ ; 19  
 14.  $x \div 3 = 12$ ; 36   15.  $4n = 28$ ; 7   16. D