

4-5 Study Guide and Intervention

Solving Two-Step Equations

Solve Two-Step Equations A two-step equation contains two operations. To solve two-step equations, use inverse operations to undo each operation in reverse order. First, undo addition/subtraction. Then, undo multiplication/division.

Example 1 Solve $\frac{c}{2} - 13 = 7$. Check your solution.

$\frac{c}{2} - 13 = 7$	Write the equation.	CHECK: $\frac{c}{2} - 13 = 7$
$\frac{c}{2} - 13 + 13 = 7 + 13$	Addition Property of Equality	$\frac{40}{2} - 13 \stackrel{?}{=} 7$
$\frac{c}{2} = 20$	Simplify.	$20 - 13 \stackrel{?}{=} 7$
$2 \cdot \frac{c}{2} = 2 \cdot 20$	Multiplication Property of Equality	$7 = 7 \checkmark$
$c = 40$	Simplify. Check your solution.	

Example 2 Solve $7y - 2y + 4 = 29$. Check your solution.

$7y - 2y + 4 = 29$	Write the equation.	CHECK: $7y - 2y + 4 = 29$
$5y + 4 = 29$	Combine like terms.	$7(5) - 2(5) + 4 \stackrel{?}{=} 29$
$\underline{-4 = -4}$	Subtraction Property of Equality	$35 - 10 + 4 \stackrel{?}{=} 29$
$5y = 25$	Simplify.	$25 + 4 \stackrel{?}{=} 29$
$\frac{5y}{5} = \frac{25}{5}$	Division Property of Equality	$29 = 29 \checkmark$
$y = 5$	Simplify. Check your solution.	

Exercises

Solve each equation. Check your solution.

- $5t + 2 = 7$
- $2x + 5 = 9$
- $6u - 8 = 28$
- $8m - 7 = 17$
- $\frac{m}{7} - 9 = 5$
- $\frac{k}{9} - 3 = -11$
- $13 + \frac{a}{4} = -3$
- $-3 + \frac{c}{2} = 12$
- $7 - h = 209$
- $-g + 18 = -32$
- $15 - p = 3$
- $-\frac{2}{5}c - 8 = 32$
- $\frac{3}{8}q + 12 = 36$
- $3 - \frac{3}{4}n = 9$
- $\frac{7}{9}v + 2 = 23$
- $7 + \frac{1}{8}l = -2$
- $\frac{v}{-3} + 8 = 22$
- $8x - 16 + 8x = 16$
- $12a - 14a = 8$
- $7c - 8 - 2c = 17$
- $6 = -y + 42 - 2y$
- $16 + 8r - 4r + 4 = 24$

4-5 Study Guide and Intervention *(continued)***Solving Two-Step Equations**

Solve Real-World Problems When solving two-step equations, always remember to add or subtract first and then multiply or divide to isolate the variable. This is the opposite of the order of operations.

Example **Nina read 50 pages of a 485-page book. Nina now plans to read 15 pages a day. The equation $50 + 15x = 485$ represents how many days it will take Nina to read the rest of the book. Write the steps that can be used to solve the equation.**

To solve the equation, first subtract 50 and then divide by 15.

$50 + 15x = 485$	Write the equation.
$50 + 15x = 485$	
$\underline{-50} \qquad = -50$	Subtraction Property of Equality
$15x = 435$	Simplify.
$\frac{15x}{15} = \frac{435}{15}$	Division Property of Equality
$x = 29$	Simplify.

CHECK: $50 + 15x = 485$	Write the equation.
$50 + 15(29) \stackrel{?}{=} 485$	Substitute the solution for x .
$50 + 435 \stackrel{?}{=} 485$	Multiply.
$485 = 485 \checkmark$	Add.

Exercises

- 1. FUNDRAISING** A high school band needs \$1,200 for a trip. So far they have raised \$430. They have 5 more fundraisers planned. The equation $\$430 + 5f = \$1,200$ represents how much money they must raise at each of the remaining fundraisers. List the series of steps you would take to solve the equation. Then give the solution.
- 2. PRINTS** Haley bought a membership to an online photo-sharing site for \$12. After purchasing the membership, she wanted to buy several prints. Prints cost \$0.12 each. She has a total of \$18.00 to spend on both the membership and the prints. The equation $\$12 + \$0.12p = \$18$ represents how many prints Haley can purchase. List the series of steps you would take to solve the equation. Then give the solution.
- 3. SAVINGS** Tim has \$85. He wants to save more money to buy a game system for \$390. He is able to save \$20 a week. The equation $\$85 + 20w = \390 represents how many weeks Tim must save. List the series of steps you would take to solve the equation. Then give the solution.
- 4. CELL PHONES** A cell phone plan costs \$14.75 per month, plus \$0.18 cents per minute. Lisa has budgeted \$35 a month for her cell phone. The equation $\$14.75 + 0.18m = \35 represents how many minutes Lisa can use each month. List the series of steps you would take to solve the equation. Then give the solution.