

# Solving Two-Step Equations

Algebra 1 • Section 2.2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

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## Quick Review and Helpful Hints

Solving means undoing operations in a sensible order while keeping both sides balanced. Show one clean move at a time, and substitute the answer back when the equation is easy to check.

▷ **Example:** Solve  $4x - 9 = 23$ .

**Work:** Add 9 to both sides:  $4x = 32$ . Divide by 4, so  $x = 8$ .

★ **Answer:**  $x = 8$

## ◆ Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Solve  $3x + 5 = 26$ . \_\_\_\_\_

6. Solve  $2.5n - 4 = 8.5$ . \_\_\_\_\_

2. Solve  $4y - 9 = 15$ . \_\_\_\_\_

7. Solve  $10 + \frac{x}{2} = 21$ . \_\_\_\_\_

3. Solve  $7 - 2a = 19$ . \_\_\_\_\_

8. Solve  $9 - 3r = -12$ . \_\_\_\_\_

4. Solve  $\frac{m}{5} + 3 = 11$ . \_\_\_\_\_

9. Solve  $6s + 1 = 4s + 17$ . \_\_\_\_\_

5. Solve  $-5p + 6 = -14$ . \_\_\_\_\_

10. Solve  $15 = 2k - 7$ . \_\_\_\_\_

## ◆ Word Problems

11. A taxi charges \$6 plus \$3 per mile. The fare is \$30. How many miles? \_\_\_\_\_

12. A savings account has \$40 already and grows by \$12 each week. When will it reach \$136? \_\_\_\_\_



## Answer Keys

1.  $x = 7$

2.  $y = 6$

3.  $a = -6$

4.  $m = 40$

5.  $p = 4$

6.  $n = 5$

7.  $x = 22$

8.  $r = 7$

9.  $s = 8$

10.  $k = 11$

11. 8 miles

12. 8 weeks

### Step-by-Step Explanations

1. Clear the +5 first to get  $3x = 21$ , then break it into 3 groups for  $x = 7$ .

2. Add 9 back to undo the subtraction, leaving  $4y = 24$ , and a quick divide by 4 gives  $y = 6$ .

3. Take the 7 off both sides for  $-2a = 12$ , then divide by  $-2$  to find  $a = -6$ .

4. Remove the +3 so  $m/5 = 8$ , then multiply by 5 to undo the division:  $m = 40$ .

5. Subtract the 6 to reach  $-5p = -20$ , and dividing by  $-5$  neatly gives  $p = 4$ .

6. Add 4 to both sides for  $2.5n = 12.5$ , then split by 2.5 to land on  $n = 5$ .

7. Knock the 10 off first so  $x/2 = 11$ , then double both sides since  $x$  was halved.

8. Move the 9 aside to get  $-3r = -21$ , and dividing by  $-3$  reveals  $r = 7$ .

9. Gather the  $s$  terms by subtracting  $4s$ , leaving  $2s + 1 = 17$ ; trim the 1 and halve for  $s = 8$ .

10. Add 7 to both sides so  $22 = 2k$ , then divide by 2 — it works the same flipped around.

11. The fare model is  $6 + 3m = 30$ ; remove the flat \$6, then divide by 3 to get 8 miles.

12. Set up  $40 + 12w = 136$ ; subtract the starting \$40 for  $12w = 96$ , so  $w = 8$  weeks.



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