

# Solving One-Step Equations

Algebra 1 • Section 2.1

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

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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  $x + 8 = 23$ .

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2. Solve  $y - 11 = 4$ .

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3. Solve  $5m = 45$ .

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4. Solve  $\frac{a}{6} = 7$ .

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5. Solve  $-3p = 24$ .

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6. Solve  $q + 2.5 = 9$ .

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7. Solve  $r - \frac{3}{4} = \frac{1}{2}$ .

\_\_\_\_\_

8. Solve  $-x = 13$ .

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9. Solve  $0.4n = 12$ .

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10. Solve  $b + 17 = -5$ .

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## ◆ Word Problems

11. A number plus 18 is 41. Find the number.

12. A movie ticket total of \$72 is split equally among 6 people. What is each share?

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## Answer Keys

1.  $x = 15$

2.  $y = 15$

3.  $m = 9$

4.  $a = 42$

5.  $p = -8$

6.  $q = 6.5$

7.  $r = \frac{5}{4}$

8.  $x = -13$

9.  $n = 30$

10.  $b = -22$

11. 23

12. \$12

### Step-by-Step Explanations

1. To get  $x$  alone, peel off the  $+8$  by subtracting 8 from both sides:  $x = 15$ .

2. Since 11 was taken away, adding it back to both sides undoes that move and frees  $y$ .

3. Here  $m$  is being multiplied by 5, so splitting both sides into 5 equal groups gives  $m = 9$ .

4. Division by 6 shrank  $a$ , so multiplying both sides by 6 rebuilds it:  $a = 42$ .

5. Undo the  $-3$  by dividing both sides by it; a positive split among negatives lands at  $p = -8$ .

6. That  $+2.5$  is just extra weight on  $q$  — lift it off both sides and  $q = 6.5$ .

7. Add  $\frac{3}{4}$  to both sides, and with a common denominator  $\frac{2}{4} + \frac{3}{4} = \frac{5}{4}$ .

8. The equation says the opposite of  $x$  is 13, so  $x$  itself must be  $-13$ .

9. Because  $n$  got scaled by 0.4, dividing both sides by 0.4 scales it back:  $n = 30$ .

10. Take 17 off both sides; starting from  $-5$  and stepping down 17 lands you at  $-22$ .

11. Turn the words into  $n + 18 = 41$ , then strip away the 18 from both sides to reveal  $n = 23$ .

12. Equal sharing means  $6x = 72$ ; divide both sides by 6 and each friend pays \$12.



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