

Solving One-Step Equations

Algebra 1 • Section 2.1

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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 $x + 8 = 23$.

2. Solve $y - 11 = 4$.

3. Solve $5m = 45$.

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

5. Solve $-3p = 24$.

6. Solve $q + 2.5 = 9$.

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

8. Solve $-x = 13$.

9. Solve $0.4n = 12$.

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

◆ 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?



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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