

Solving Multi-Step Equations

Algebra 1 • Section 2.3

Name: _____

Date: _____

Score: _____ / 12

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 $2(x + 5) = 34$. _____

6. Solve $2(4y - 3) = 5y + 15$. _____

2. Solve $3(a - 4) + 7 = 22$. _____

7. Solve $9 - 3(2r + 1) = 0$. _____

3. Solve $5 - 2(3p - 1) = -17$. _____

8. Solve $6 + \frac{m-2}{4} = 10$. _____

4. Solve $4(2n + 1) - 3n = 29$. _____

9. Solve $7(2q - 1) - 4q = 23$. _____

5. Solve $\frac{x+6}{3} = 8$. _____

10. Solve $18 = 3(2z + 4)$. _____

◆ Word Problems

11. A gym charges \$25 plus \$8 per class. After a \$5 coupon, the total is \$84. How many classes? _____

12. Three times the sum of a number and 4 is 45. Find the number. _____



Answer Keys

1. $x = 12$

2. $a = 9$

3. $p = 4$

4. $n = 5$

5. $x = 18$

6. $y = 7$

7. $r = 1$

8. $m = 18$

9. $q = 3$

10. $z = 1$

11. 8 classes

12. 11

Step-by-Step Explanations

1. Either distribute or just divide by 2 — both lead to $x + 5 = 17$, so $x = 12$.
2. Spread the 3 inside, tidy up to $3a - 5 = 22$, then add 5 and divide by 3 for $a = 9$.
3. Distribute carefully to $5 - 6p + 2 = -17$, combine to $7 - 6p = -17$, and finish with $p = 4$.
4. Open the parentheses, then merge like terms into $5n + 4 = 29$ — much friendlier to solve, giving $n = 5$.
5. The whole top is divided by 3, so multiply both sides by 3 first, then subtract 6.
6. Distribute the left into $8y - 6$, gather y terms and constants, and $3y = 21$ gives $y = 7$.

7. Distribute the -3 , simplify to $6 - 6r = 0$, and balancing both sides shows $r = 1$.
8. Clear the $+6$ so the fraction equals 4, multiply by 4 to undo it, then add the 2 back.
9. After distributing and collecting terms you get $10q - 7 = 23$, a clean two-step finish to $q = 3$.
10. Dividing both sides by 3 early makes things lighter: $6 = 2z + 4$ quickly gives $z = 1$.
11. Write $25 + 8c - 5 = 84$, fold the constants into $20 + 8c = 84$, and $8c = 64$ means 8 classes.
12. 'Three times the sum' becomes $3(n + 4) = 45$; divide by 3 for $n + 4 = 15$, then subtract 4.



Want Even More Algebra 1 Practice?



Texas STAAR Algebra I Preparation Bundle

18 full-length practice tests across three books
Fresh test practice, detailed explanations, and organized review



18 Tests
3 Books
One Bundle

Important: These Algebra 1 resources are made for extra practice after the worksheet. Use the QR code for the state or program bundle connected with this worksheet.

Skill Review

- ✓ Strengthens equations, functions, systems, and modeling
- ✓ Supports steady review before tests
- ✓ Good for tutoring, homework, and independent practice

Build the foundation.

Test Practice

- ✓ Full-length practice tests for realistic pacing
- ✓ Detailed answer explanations for every test
- ✓ Useful after students finish topic worksheets

Practice with purpose.

Confidence

- ✓ Turns mistakes into targeted review
- ✓ Helps students see progress over time
- ✓ Keeps preparation organized and calm

Move forward prepared.