

Solving Two-Step Equations

Algebra 1 • Section 2.2

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 $3x + 5 = 26$.

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 $s = 8$.

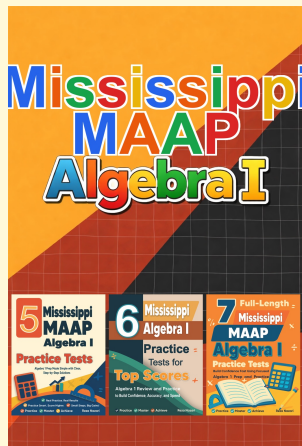
10. Add 7 to both sides so $22 = 2k$, then divide by 2 — it works the same flipped around.

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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