Solving Systems by Elimination

Algebra 1 •Section 6.3

Name: ______________________	Date: ______________	Score: _____ / 12

Quick Review and Helpful Hints

A system asks for values that satisfy every relationship at the same time. The solution may be one point, no point, or infinitely many points, depending on how the graphs or equations meet.

▷ **Example:** Solve $y = x + 4$ and $y = 10$.

Work: Substitute 10 for y: $10 = x + 4$, so $x = 6$. The solution is the point where both equations agree.

★ **Answer:** $(6, 10)$

Practice Problems

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

1. Solve: $x + y = 10$, $x - y = 2$. ________

2. Solve: $2x + 3y = 14$, $2x - y = 6$. ________

3. Solve: $3x + 2y = 16$, $3x - 2y = 8$. ________

4. Solve: $4a + b = 19$, $2a - b = 5$. ________

5. Solve: $5x + 2y = 1$, $5x - 2y = 9$. ________

6. Solve: $2m + n = 12$, $m - n = 3$. ________

7. Solve: $6x + 3y = 21$, $2x + y = 7$. ________

8. Solve: $x + 2y = 7$, $3x + 2y = 15$. ________

9. Solve: $2x + 5y = 18$, $2x + 5y = 21$. ________

10. Solve: $7p - 2q = 20$, $3p + 2q = 10$. ________

Word Problems

11. A school sold adult and child tickets. $a + c = 90$ and $10a + 6c = 700$. Find a and c. ________

12. Two numbers have sum 44 and difference 10. Find them. ________

Answer Keys

1. $(6,4)$	**7.** Infinitely many solutions
2. $(4,2)$	**8.** $(4,\frac{3}{2})$
3. $(4,2)$	**9.** No solution
4. $(4,3)$	**10.** $(3,\frac{1}{2})$
5. $(1,-2)$	**11.** $a=40,\ c=50$
6. $(5,2)$	**12.** 27 and 17

Step-by-Step Explanations

1. Stack and add — the $+y$ and $-y$ cancel, leaving $2x = 12$, so $x = 6$ and $y = 4$.
2. Both have $2x$, so subtract to wipe out x: $4y = 8$ gives $y = 2$, then $x = 4$.
3. The $+2y$ and $-2y$ are opposites, so adding erases y: $6x = 24$ means $x = 4$, then $y = 2$.
4. Notice $+b$ and $-b$ — add the equations and they vanish, leaving $6a = 24$, so $a = 4$ and $b = 3$.
5. Adding cancels the y terms cleanly: $10x = 10$, so $x = 1$, and back-substituting gives $y = -2$.
6. From the second, $n = m - 3$; feed that into the first and $3m - 3 = 12$ delivers $m = 5$.
7. Divide the first by 3 and it's identical to the second — one line in disguise, so every point fits.
8. Both carry $2y$, so subtract them to knock it out: $2x = 8$ gives $x = 4$.
9. The left sides are twins but they're set equal to different numbers — that can never both be true.
10. The $-2q$ and $+2q$ are opposites, so adding clears q: $10p = 30$ gives $p = 3$.
11. Scale the count equation by 6 so the c terms match, then subtract to leave a alone.
12. Add $x + y = 44$ to $x - y = 10$ and the y's cancel out, giving $2x = 54$.

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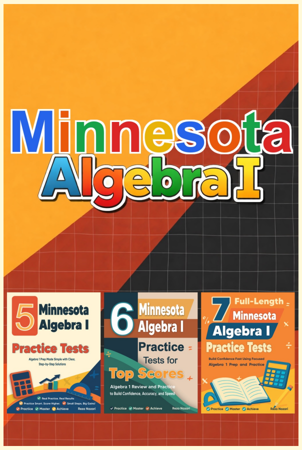

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