Solving Systems by Graphing

Algebra 1 •Section 6.1

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 by graphing idea: $y = x + 2$ and $y = 6$. ______

2. Solve $y = 2x + 1$ and $y = 7$. ______

3. Solve $y = -x + 5$ and $y = x + 1$. ______

4. Solve $x = 4$ and $y = 3x - 2$. ______

5. Solve $y = 2$ and $y = x - 5$. ______

6. What does the intersection of two lines represent? ______

7. Parallel lines in a system have how many solutions? ______

8. Same line written twice gives how many solutions? ______

9. Solve $y = 4x$ and $y = x + 9$. ______

10. Solve $x + y = 8$ and $x - y = 2$. ______

Word Problems

11. Two lines meet at $(6, 11)$. What is the solution of the system? ______

12. A cost graph and revenue graph intersect at $(40, 300)$. Interpret it. ______

Answer Keys

1. $(4, 6)$	7. No solution
2. $(3, 7)$	8. Infinitely many
3. $(2, 3)$	9. $(3, 12)$
4. $(4, 10)$	10. $(5, 3)$
5. $(7, 2)$	11. $(6, 11)$
6. The ordered pair satisfying both equations	12. Break-even at 40 items and $\$300$

Step-by-Step Explanations

1. The lines cross where their y's agree, so $6 = x + 2$ tells you $x = 4$.

2. At the meeting point $2x + 1 = 7$; subtract and divide and $x = 3$ appears.

3. Equal heights mean $-x+5 = x+1$; gather the x's and $4 = 2x$ gives $x = 2$.

4. You're handed $x = 4$ outright — just carry it into the line and y works out to 10.

5. Since y is locked at 2, set $2 = x - 5$ and adding 5 reveals $x = 7$.

6. That crossing point sits on both graphs at once, so it's the single pair that makes both equations true.

7. Parallel lines run forever without ever touching, so there's no shared point to be the solution.

8. If both equations draw the same line, every single point on it satisfies the system.

9. They share a y, so $4x = x + 9$; the leftover $3x = 9$ gives $x = 3$.

10. Add the two equations and the y's cancel, leaving $2x = 10$, so $x = 5$ and $y = 3$.

11. The whole point of a system is that meeting spot — the intersection IS the solution.

12. Where the graphs cross, money in equals money out — that's the break-even moment.

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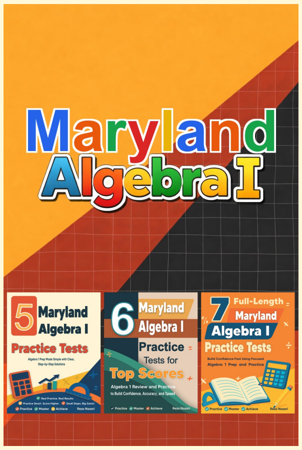

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