ALBERT

Name _____ Date _____

Solving Systems by Elimination Worksheet

Algebra 1 · Common Core HSA-REI.C.5

> Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

Practice

Builds the skill step by step.

1. Solve the system by adding the equations: $x + y = 10$ and $x - y = 4$.

2. What do you get when you add the equations $x + y = 10$ and $x - y = 4$?

   A. $2x = 14$

   B. $2y = 6$

   C. $2x = 6$

   D. $2x + 2y = 14$

3. Solve the system $2x + y = 11$ and $3x - y = 4$.

4. You want to eliminate x from $x + 2y = 7$ and $3x - y = 7$ by adding. What should you multiply the first equation by?

   A. 2

   B. -2

   C. 3

   D. -3

5. Solve the system $x + 2y = 7$ and $3x - y = 7$.

6. Why is the sum of two true equations also true?

   A. Because addition is commutative.

   B. Because the right sides are always positive.

   C. Adding equal amounts to equal amounts keeps the sides equal.

   D. Because the variables always cancel.

7. Solve the system $x + 3y = 9$ and $-x + y = 3$.

8. Solve the system $4x + 3y = 10$ and $4x - y = 2$.

9. In the system $x + y = 10$ and $x - y = 4$, the second equation is replaced by the sum of the two equations. The new system is $x + y = 10$ and $2x = 14$. How do the solutions compare?

   A. The new system has different solutions.

   B. They are the same: (7, 3) solves both systems.

   C. The new system has no solution.

   D. The new system has infinitely many solutions.

10. Solve the system $5x + 2y = 16$ and $3x - 2y = 0$.

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On Level

Grade-level practice.

1. Solve the system $2x + 3y = 12$ and $4x - 3y = 6$.

2. Solve the system $3x + 2y = 7$ and $2x - y = 7$.

3. In the system $3x + 2y = 7$ and $2x - y = 7$, the second equation is replaced by the sum of the first equation and 2 times the second. Which system results?

   A. $7x = 21$ and $2x - y = 7$

   B. $3x + 2y = 7$ and $7x = 21$

   C. $3x + 2y = 7$ and $5x + y = 14$

   D. $3x + 2y = 7$ and $7x + 4y = 21$

4. Solve the system $2x + 5y = -11$ and $3x - 2y = 12$.

5. How many solutions does the system $x + y = 5$ and $2x + 2y = 10$ have?

   A. Exactly two

   B. None

   C. Exactly one

   D. Infinitely many

6. How many solutions does the system $x + y = 5$ and $2x + 2y = 7$ have?

   A. Infinitely many

   B. Exactly two

   C. None

   D. Exactly one

7. Solve the system $0.5x + y = 4$ and $1.5x - y = 8$.

8. Solve the system $6x - 4y = 2$ and $3x + 5y = 29$.

9. Which multipliers eliminate y when you add the equations $2x + 3y = 5$ and $5x - 4y = 1$?

   A. Multiply the first by 4 and the second by 3.

   B. Multiply the first by 5 and the second by 2.

   C. Multiply the first by 3 and the second by 4.

   D. Multiply the first by -4 and the second by 3.

10. Solve the system $2x + 3y = 5$ and $5x - 4y = 1$.

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Challenge

Multi-step and word problems that stretch it.

1. Suppose (a, b) is a solution of both Ax + By = C and Dx + Ey = F. Why is (a, b) also a solution of (A + kD)x + (B + kE)y = C + kF?

   A. Because Aa + Bb = C and k(Da + Eb) = kF, and adding equal amounts to both sides keeps them equal.

   B. Because k can be any number, so the equation is always true.

   C. Because the new equation is the same line as Ax + By = C.

   D. Because a and b are both 0.

2. In a system, Ax + By = C is replaced by (A + kD)x + (B + kE)y = C + kF, and Dx + Ey = F is kept. Why does every solution of the new system also solve the original system?

   A. Because the new equation has more terms.

   B. Because both systems have no solution.

   C. Subtracting k times Dx + Ey = F from the new equation gives back Ax + By = C.

   D. Because k is always positive.

3. 2 adult tickets and 3 child tickets cost 34 dollars. 3 adult tickets and 1 child ticket cost 30 dollars. How much is an adult ticket?

4. The system ax + y = 7 and ax − y = 1 has a solution with x = 2. Find a.

5. Cole adds $3x + 2y = 8$ and $x - 2y = 4$ and writes $4x = 4$. What went wrong?

   A. He should have subtracted the equations.

   B. Nothing went wrong.

   C. He added the x terms wrong; it should be $3x$.

   D. He added the right sides wrong; $8 + 4 = 12$, so $4x = 12$.

6. Solve the system $3x + 2y = 8$ and $x - 2y = 4$.

7. Solve the system $\frac{x}{2} + \frac{y}{3} = 4$ and $\frac{x}{2} - \frac{y}{3} = 0$.

8. For which value of k does the system $x + 2y = 3$ and $2x + 4y = k$ have infinitely many solutions?

   A. 0

   B. 6

   C. 12

   D. 3

9. Solve the system $7x + 3y = 1$ and $5x + 2y = 0$.

10. A jar has 20 coins, all nickels and quarters, worth 3.40 dollars in all. How many quarters are in the jar?