

NAME: _____

P.I. A.A.10: Solve systems of two linear equations in two variables algebraically

1. Explain two ways to use elimination to solve the system below. Show both solutions.

$$5x - 2y = 3$$

$$2x - 3y = 10$$

2. For solving the system $2x + y = 8$ and $3x - 4y = -10$, which method do you think is better, substitution or elimination? Explain your choice.
3. Explain how to solve a system of equations by substitution.
4. Tell whether the statement “If a system of linear equations has one solution, the graphs of the lines are perpendicular” is *true* or *false*. Explain your reasoning.
5. True or False? If a system of linear equations has two solutions, then it has an infinite number of solutions. Explain your answer.

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6. Make up a system of equations that is easy to solve by substitution. Give its solution.

7. Write a system of two linear equations with the given characteristics.
one solution; $(1, 2)$

8. Write a system of linear equations with infinitely many solutions. Use substitution to show that your system has infinitely many solutions.

9. Write a system of linear equations with no solutions. Use substitution to show that your system has no solutions.

10. Write a system of linear equations with no solutions that can easily be solved using elimination. Show how to solve your system using elimination.

Multiply the first equation by -3 and the second equation by 2 and add.

$$-15x + 6y = -9$$

$$\underline{4x - 6y = 20}$$

$$-11x = 11$$

$$x = -1$$

$$5(-1) - 2y = 3$$

$$-2y = 8$$

$$y = -4$$

Multiply the first equation by 2 and the second equation by -5 and add.

$$10x - 4y = 6$$

$$\underline{-10x + 15y = -50}$$

$$11y = -44$$

$$y = -4$$

$$5x - 2(-4) = 3$$

$$5x = -5$$

[1] $x = -1$

Answers may vary. Sample: Elimination is better since you can multiply the first equation by 4 , then add the equations. The result, $11x = 22$, will be easy to solve for x .

[3] Answers may vary. Sample: Solve one equation for x or y . Substitute the expression for x (or y) in the other equation. You will now have an equation in one variable. Solve for that variable. Use the value of that variable in the other equation to find the value of the second variable.

[4] False; any two intersecting lines have one solution, not just perpendicular lines.

[5] True. Either two lines meet in no, one, or all points. If the system has two solutions, it must have an infinite number.

[6] Answers may vary. Sample: $y = 3x$ and $x + y = 12$. The solution is $(3, 9)$.

[7] Answers may vary. Sample: $y = x + 1$, $y = 2x$

Answers may vary. Sample:

$$y = 4x - 1$$

$$2y = 8x - 2$$

$$2(4x - 1) = 8x - 2$$

[8] $8x - 2 = 8x - 2$

Answers may vary. Sample:

$$y = 4x - 1$$

$$y = 4x - 2$$

$$4x - 1 = 4x - 2$$

[9] $-1 \neq -2$

Answers may vary. Sample:

$$x - y = 6$$

$$x - y = 5$$

[10] $0 \neq 1$
