

Let's see if we got this...

Solve each system by substitution.

$$1) \begin{aligned} y &= -7x + 19 \\ 4x - 4y &= -12 \end{aligned}$$

(2, 5)

$$4x - 4(-7x + 19) = -12$$

$$4x + 28x - 76 = -12$$

$$32x - 76 = -12$$

$$\begin{aligned} 32x &= 64 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} y &= -7(2) + 19 \\ y &= 5 \end{aligned}$$

$$3) \begin{aligned} y &= 4x + 22 \\ 8x - 2y &= -44 \end{aligned}$$

$$8x - 2(4x + 22) = -44$$

$$8x - 8x - 44 = -44$$

$$-44 = -44$$

I.M.S

$$2) \begin{aligned} -3x + 3y &= -1 \\ y &= x - 2 \end{aligned}$$

$$-3x + 3(x - 2) = -1$$

$$\cancel{-3x} + 3x - 6 = -1$$

$$-6 = -1$$

NO SOL.

$$4) \begin{aligned} y &= 7x - 6 \\ 3x + 4y &= 7 \end{aligned}$$

$$3x + 4(7x - 6) = 7$$

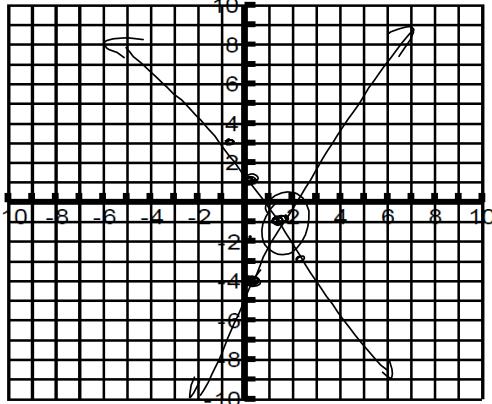
$$3x + 28x - 24 = 7$$

$$\begin{aligned} 31x &= 31 \\ x &= 1 \end{aligned}$$

$$y = 7(1) - 6$$

$$y = 1$$

Ways of Solving a System

Method	When do we use it?	Example:	
Graphing	When we want to find an approximate solution.	$y = -2x + 1$ $m = -\frac{2}{1}, b = 1$ $y = 3x - 4$ $m = \frac{3}{1}, b = -4$	
Substitution	When one (or both) equation(s) is solved for one variable.	$y = x + 3$ $2x - 4y = -12$ $2x - 4(x+3) = -12$ $2x - 4x - 12 = -12$ $-2x - 12 = -12$ $-2x = 0$ $x = 0$ $y = 0 + 3$ $y = 3$ $(0, 3)$	$y = x + 3$ $y = 2x - 4$ $x + 3 = 2x - 4$ $\cancel{-2x} \quad \cancel{-2x}$ \hline $-x + 3 = -4$ $-x = -7$ $x = 7$ $y = 7 + 3$ $y = 10$ $(7, 10)$
Elimination	When both equations are written in standard form.	$-x + 3y = 3$ $4x - 3y = 6$ \hline $3x = 9$ $(X = 3)$ $-x + 3y = 3$ $-3 + 3y = 3$ $3y = 6$ $y = 2$ $(3, 2)$	$-1. (2x - 3y = -13)$ $\cdot 2x + 2y = 7$ \hline $-2x + 3y = 13$ $2x + 2y = 7$ \hline $5y = 20$ $(y = 4)$ $2x + 2y = 7$ $2x + 2(4) = 7$ $2x + 8 = 7$ \hline $2x = -1$ $X = -\frac{1}{2}$ $(-\frac{1}{2}, 4)$

Solving Systems by Elimination**Steps**

1. Arrange the equations with like terms in columns.
2. Multiply, if necessary, to create opposite coefficients for one variable.
3. Add/Subtract the equations.
4. Substitute the value to solve for the other variable.
5. Write your answer as an ordered pair.
6. Check your answer.

$$\begin{array}{l} 1. \quad 2x - 2y = -8 \\ \quad 2x + 2y = 4 \\ \hline 4x = -4 \\ x = -1 \\ \text{(}-1, 3\text{)} \end{array}$$

$$\begin{array}{l} 2. \quad 4x + 3y = 16 \\ \quad 2x - 3y = 8 \\ \hline 6x = 24 \\ x = 4 \\ \text{(}4, 0\text{)} \end{array}$$

$$\begin{array}{l} 3. \quad 3x + 2y = 7 \\ \quad -3x + 4y = 5 \\ \hline 6y = 12 \\ y = 2 \\ \text{(}1, 2\text{)} \end{array}$$

$$\begin{array}{l} 4. \quad 2(2x - 3y = -2) \\ \quad -4x + 5y = 2 \\ \hline 4x - 6y = -4 \\ -4x + 5y = 2 \\ \hline -y = -2 \\ y = 2 \\ \text{(}2, 2\text{)} \end{array}$$

$$\begin{array}{l} 5. \quad 5x + 2y = 7 \\ \quad -2(4x + y = -16) \\ \hline 5x + 2y = 7 \\ 8x - 2y = 32 \\ \hline 13x = 39 \\ x = 3 \\ \text{(}3, -4\text{)} \end{array}$$

$$\begin{array}{l} 6. \quad 2(2x + 3y = 1) \\ \quad 2(4x - 2y = 10) \\ \hline 4x + 9y = 3 \\ 8x - 4y = 12 \\ \hline 5y = 15 \\ y = 3 \\ \text{(-4, 3)} \end{array}$$

Solving Systems of Equations using Elimination

Name: _____

Solve the system of equations using elimination.

$$\begin{array}{l} 1. \quad 2x + y = 4 \\ \quad x - y = 2 \end{array}$$

$$\begin{array}{r} 3x = 6 \\ x = 2 \end{array}$$

$$\begin{array}{l} 2(2) + y = 4 \\ 4 + y = 4 \\ y = 0 \end{array}$$

(2, 0)

$$\begin{array}{l} 2. \quad x + 4y = 23 \\ \quad -x + y = 2 \end{array}$$

$$\begin{array}{r} 5y = 25 \\ y = 5 \end{array}$$

$$\begin{array}{l} x + 4(5) = 23 \\ x + 20 = 23 \end{array}$$

$$\begin{array}{r} x = 3 \\ x = 3 \end{array}$$

$$\begin{array}{l} 3. \quad x - y = 8 \\ \quad x + y = 20 \end{array}$$

$$\begin{array}{r} 2x = 28 \\ x = 14 \end{array}$$

$$\begin{array}{l} 4x + 20 \\ y = 6 \end{array}$$

$$\begin{array}{l} 4. \quad 3x + y = 16 \\ \quad -3x + 4y = 19 \end{array}$$

$$\begin{array}{r} 5y = 35 \\ y = 7 \end{array}$$

(3, 7)

$$\begin{array}{r} 3x + 7 = 16 \\ 3x = 9 \end{array}$$

$$\begin{array}{r} x = 3 \\ x = 3 \end{array}$$

$$\begin{array}{l} 5. \quad 5x + 2y = 5 \\ \quad -2(3x + y = 2) \end{array}$$

$$\begin{array}{r} 5x + 2y = 5 \\ -6x - 2y = -4 \end{array}$$

$$\begin{array}{r} x = 1 \\ x = 1 \end{array}$$

$$\begin{array}{r} y = -1 \\ y = -1 \end{array}$$

$$\begin{array}{r} (-1, -1) \\ (-1, -1) \end{array}$$

$$\begin{array}{l} 6. \quad 4(3x + 5y = 6) \\ \quad -12x + 6y = 15 \end{array}$$

$$\begin{array}{r} -12x + 12y = 24 \\ -12x + 6y = 15 \end{array}$$

$$\begin{array}{r} 32y = 39 \\ y = 1.5 \end{array}$$

$$\begin{array}{r} 3x + 7.5 = 6 \\ 3x = -1.5 \end{array}$$

$$\begin{array}{r} x = -0.5 \\ x = -0.5 \end{array}$$

$$\begin{array}{l} 7. \quad \begin{cases} 2x + 6y = 4 \\ 3x - 7y = 6 \end{cases} \end{array}$$

$$\begin{array}{l} -6x - 18y = -12 \\ 6x - 14y = 12 \end{array}$$

$$\begin{array}{r} 32y = 0 \\ y = 0 \end{array}$$

$$\begin{array}{r} 2 \\ 2 \end{array}$$

$$\begin{array}{r} (2, 0) \\ (2, 0) \end{array}$$

$$\begin{array}{l} 8. \quad 4(4x + 5y = -2) \\ \quad 5(5x - 4y = -23) \end{array}$$

$$\begin{array}{r} 16x + 20y = -8 \\ 25x - 20y = -115 \end{array}$$

$$\begin{array}{r} 41x = -123 \\ x = -3 \end{array}$$

$$\begin{array}{r} y = 2 \\ y = 2 \end{array}$$

$$\begin{array}{r} (-3, 2) \\ (-3, 2) \end{array}$$

$$\begin{array}{l} 9. \quad 2(4x - 3y = 11) \\ \quad 3(3x + 2y = -13) \end{array}$$

$$\begin{array}{r} 8x - 6y = 22 \\ 9x + 6y = -39 \end{array}$$

$$\begin{array}{r} 17x = -17 \\ x = -1 \end{array}$$

$$\begin{array}{r} y = 10 \\ y = 10 \end{array}$$

$$\begin{array}{r} (-1, -5) \\ (-1, -5) \end{array}$$

$$\begin{array}{l} 10. \quad \begin{cases} 2x - y = 16 \\ 3x + 5y = 11 \end{cases} \end{array}$$

$$\begin{array}{r} 10x - 5y = 80 \\ 3x + 5y = 11 \end{array}$$

$$\begin{array}{r} 13x = 91 \\ x = 7 \end{array}$$

$$\begin{array}{r} (7, -2) \\ (7, -2) \end{array}$$

$$\begin{array}{l} 11. \quad -1(x + 3y = -7) \\ \quad x - 5y = 9 \end{array}$$

$$\begin{array}{r} -x - 3y = 7 \\ x - 5y = 9 \end{array}$$

$$\begin{array}{r} -8y = 16 \\ y = -2 \end{array}$$

$$\begin{array}{r} (-1, -2) \\ (-1, -2) \end{array}$$

$$\begin{array}{l} 12. \quad 5(-7x + 8y = 32) \\ \quad 7(5x + 6y = 24) \end{array}$$

$$\begin{array}{r} -35x + 40y = 160 \\ 35x + 42y = 168 \end{array}$$

$$\begin{array}{r} 82y = 328 \\ y = 4 \end{array}$$

$$\begin{array}{r} 5x + 6(4) = 24 \\ 5x + 24 = 24 \end{array}$$

$$\begin{array}{r} 5x = 0 \\ x = 0 \end{array}$$

$$\begin{array}{r} (0, 4) \\ (0, 4) \end{array}$$

Find the error:

13.

$$\begin{array}{r} + \\ \hline -10y = -10 \\ y = 1 \end{array}$$

$$\begin{array}{r} -2y = -10 \\ y = 5 \end{array}$$

$$\begin{array}{r} 3x - 4(5) = -5 \\ 3x - 20 = -5 \end{array}$$

$$\begin{array}{r} 3x + 20 = -5 \\ 3x + 20 = -5 \end{array}$$

$$\begin{array}{r} \frac{3x}{3} = \frac{15}{3} \\ x = 5 \end{array}$$

$$\begin{array}{r} 3x - 4(+1) = -5 \\ 3x - 4 = -5 \end{array}$$

$$\begin{array}{r} 3x = -1 \\ x = -\frac{1}{3} \end{array}$$

$$\begin{array}{r} (-\frac{1}{3}, 1) \\ (-\frac{1}{3}, 1) \end{array}$$

Evens or Odds or Choose 9 or
do All 3