

Key

Math 1

3-3 Homework

Name _____

Date _____

Use the elimination method to solve the following. Write the solution as an ordered pair.

$$1. \begin{cases} -x - 5y = -16 \\ x + 2y = 7 \end{cases} \quad \boxed{(1, 3)}$$

$$\underline{-3y = -9}$$

$$y = 3$$

$$x + 2(3) = 7$$

$$x + 6 = 7$$

$$x = 1$$

$$3. \begin{cases} 6x + 4y = -10 \\ -6x + 5y = 1 \end{cases} \quad \boxed{(-1, -1)}$$

$$\underline{9y = -9}$$

$$y = -1$$

$$6x + 4(-1) = -10$$

$$6x - 4 = -10$$

$$6x = -6$$

$$x = -1$$

$$5. \begin{cases} 10x - 14 = 2y \\ 10x - 11 = 3y \end{cases}$$

$$-1(10x - 11 = 3y) \rightarrow -10x + 11 = -3y$$

$$\underline{-3 = -y}$$

$$3 = y$$

$$\boxed{(2, 3)}$$

$$10x - 14 = 2(3)$$

$$10x - 14 = 6$$

$$10x = 20$$

$$x = 2$$

$$2. \begin{cases} 2x - 8y = -6 \\ 5x + 8y = -1 \end{cases} \quad \boxed{(-1, \frac{1}{2})}$$

$$\underline{7x = -7}$$

$$x = -1$$

$$2(-1) - 8y = -6$$

$$-2 - 8y = -6$$

$$-8y = -4$$

$$y = \frac{1}{2}$$

$$4. \begin{cases} 2x + y = 19 \\ x - y = 11 \end{cases} \quad \boxed{(10, -1)}$$

$$\underline{3x = 30}$$

$$x = 10$$

$$(10) - y = 11$$

$$-y = 1$$

$$y = -1$$

$$3(3x - 2y = 9) \rightarrow 9x - 6y = 27$$

$$2(-4.5x + 3y = 2) \rightarrow -9x + 6y = 4$$

$$\underline{0 = 31x}$$

$\boxed{\text{No solution}}$

These lines are parallel!
Do not intersect!

$$7. \begin{cases} 2(5x+y=9) \rightarrow 10x+2y=18 \\ 10x-7y=-18 \end{cases} \rightarrow \begin{array}{r} 10x+2y=18 \\ 10x-7y=-18 \\ \hline -9y=36 \end{array}$$

$$\boxed{(1, 4)}$$

$$\begin{aligned} y &= 4 \\ 5x + (4) &= 9 \\ 5x &= 5 \\ x &= 1 \end{aligned}$$

$$8. \begin{cases} -4x-14y=28 \rightarrow -4x-14y=28 \\ -2(-x-7y=14) \rightarrow 2x+14y=-28 \end{cases}$$

$$\boxed{(0, -2)}$$

$$\begin{aligned} -2x &= 0 \\ x &= 0 \\ -(-0) - 7y &= 14 \\ -7y &= 14 \\ y &= -2 \end{aligned}$$

$$9. \begin{cases} 2x+8y=-12 \rightarrow 2x+8y=-12 \\ -2(-3x+4y=30) \rightarrow 6x-8y=-60 \end{cases}$$

$$\boxed{(-9, \frac{3}{4})}$$

$$\begin{aligned} 8x &= -72 \\ x &= -9 \end{aligned}$$

$$-3(-9) + 4y = 30$$

$$\begin{aligned} 27 + 4y &= 30 \\ 4y &= 3 \\ y &= \frac{3}{4} \end{aligned}$$

$$\boxed{\frac{3}{4}}$$

$$10. \begin{cases} -3-7y=10x \rightarrow -3-7y=10x \\ -7(3+2x-y=0) \rightarrow -21-14x+7y=0 \end{cases}$$

$$\boxed{(-1, 1)}$$

$$+ \begin{array}{r} -21-14x+7y=0 \\ -3-7y=10x \\ \hline -24 = 24x \end{array}$$

$$\begin{aligned} -24 &= 24x \\ -1 &= x \end{aligned}$$

$$\begin{cases} 3 + 2(-1) - y = 0 \rightarrow -y = -1 \\ 3 + (-2) - y = 0 \\ 1 - y = 0 \end{cases} \rightarrow y = 1$$

$$11. \begin{cases} 5x+8y=15 \\ -5x-8y=-15 \end{cases} \rightarrow 0=0 \checkmark$$

Infinitely many solutions

They are the same line!

$$12. \begin{cases} 4(x-3y=-6) \rightarrow 4x-12y=-24 \\ -4x+9y=9 \end{cases}$$

$$\boxed{(9, 5)}$$

$$-3y = -15$$

$$y = 5$$

$$x - 3(5) = -6$$

$$x - 15 = -6$$

$$x = 9$$