

Name: Key

Unit 2: Linear Functions



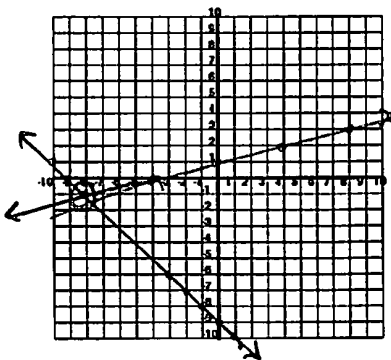
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Homework 4: Solving Systems of Equations
by Graphing & Substitution

**** This is a 2-page document! ****

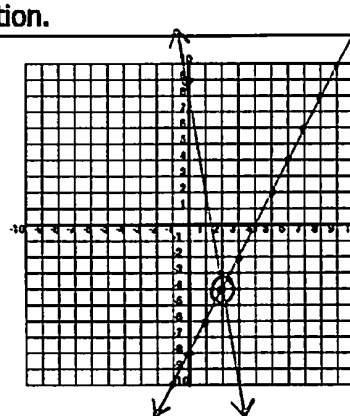
Directions: Solve each equation by graphing. Clearly identify your solution.

1. $y = \frac{1}{4}x + 1$
 $y = -x - 9$



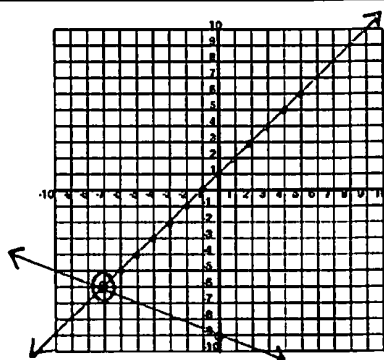
(-8, -1)

2. $y = 2x - 8$
 $13x + 2y = 18$
 $2y = -13x + 18$
 $y = -\frac{13}{2}x + 9$



(2, -4)

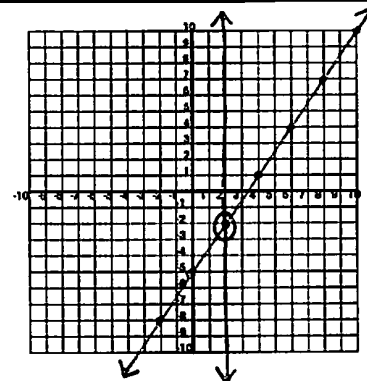
3. $3x + 7y = -63$
 $x - y = -1$
 $3x + 7y = -63$
 $7y = -3x - 63$
 $y = -\frac{3}{7}x - 9$



$x - y = -1$
 $-y = -x - 1$
 $y = x + 1$

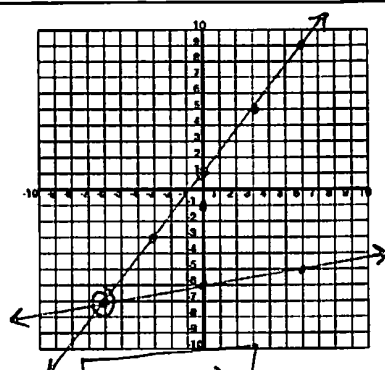
(-7, -6)

4. $3x - 2y = 10$
 $x = 2$
 $3x - 2y = 10$
 $-2y = -3x + 10$
 $y = \frac{3}{2}x - 5$



(2, -2)

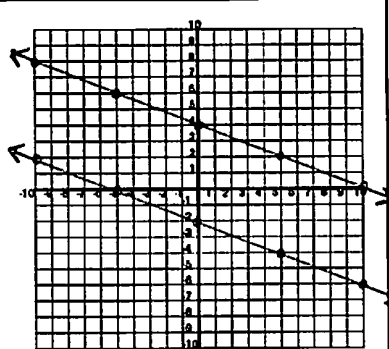
5. $-6y = 36 - x$
 $4x - 3y = -3$
 $-6y = 36 - x$
 $-6y = -x + 36$
 $y = \frac{1}{6}x - 6$



$4x - 3y = -3$
 $-3y = -4x - 3$
 $y = \frac{4}{3}x + 1$

(-6, -7)

6. $-12x = 30y + 60$
 $2x + 5y = 20$
 $-12x = 30y + 60$
 $-12x - 60 = 30y$
 $-\frac{2}{5}x - 2 = y$



$2x + 5y = 20$
 $5y = -2x + 20$
 $y = -\frac{2}{5}x + 4$

No Solution!

Directions: Solve each equation by substitution. Clearly identify your solution.

7. $y = -2x + 14$
 $y = 5x - 7$

$$\begin{aligned} -2x + 14 &= 5x - 7 \\ 14 &= 7x - 7 \\ 21 &= 7x \\ 3 &= x \end{aligned}$$

$$\begin{aligned} y &= 5(3) - 7 \\ y &= 15 - 7 \\ y &= 8 \end{aligned}$$

$(3, 8)$

8. $y = -4x - 9$
 $7x + 4y = -27$

$$\begin{aligned} 7x + 4(-4x - 9) &= -27 \\ 7x - 16x - 36 &= -27 \\ -9x &= 9 \\ x &= -1 \end{aligned}$$

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

$(-1, -5)$

9. $x - y = -9 \rightarrow x = y - 9$
 $8x - 3y = -62$

$$8(y - 9) - 3y = -62$$

$$8y - 72 - 3y = -62 \quad x = 2 - 9$$

$$5y - 72 = -62 \quad x = -7$$

$$5y = 10$$

$$y = 2$$

$(-7, 2)$

10. $7x - y = 34 \rightarrow y = 7x - 34$
 $2x + 3y = -10$

$$2x + 3(7x - 34) = -10$$

$$2x + 21x - 102 = -10$$

$$23x = 92$$

$$x = 4$$

$$7(4) - y = 34$$

$$28 - y = 34$$

$$-y = 6$$

$$y = -6$$

$(4, -6)$

11. $2x = 16 - 8y \rightarrow x = 8 - 4y$
 $x + 4y = 25$

$$8 - 4y + 4y = 25$$

$$8 \neq 25$$

No Solution!

12. $-\frac{2}{3}x - 7y = 6$
 $x + 3y = -9 \rightarrow x = -3y - 9$

$$-\frac{2}{3}(-3y - 9) - 7y = 6$$

$$2y + 6 - 7y = 6$$

$$-5y = 0$$

$$y = 0$$

$$x + 3(0) = -9$$

$$x = -9$$

$(-9, 0)$

13. $2x - 9y = 26$

$$6x - 2y = -22 \rightarrow \begin{aligned} 6x + 22 &= 2y \\ 3x + 11 &= y \end{aligned}$$

$$2x - 9(3x + 11) = 26$$

$$2x - 27x - 99 = 26$$

$$-25x = 125$$

$$x = -5$$

$$2(-5) - 9y = 26$$

$$-10 - 9y = 26$$

$$-9y = 36$$

$$y = -4$$

$(-5, -4)$

14. $3x - 2y = 10 \rightarrow \begin{aligned} 3x - 10 &= 2y \\ \frac{3}{2}x - 5 &= y \end{aligned}$
 $9x + 4y = -50$

$$9x + 4\left(\frac{3}{2}x - 5\right) = -50$$

$$9x + 6x - 20 = -50$$

$$15x - 20 = -50$$

$$15x = -30$$

$$x = -2$$

$$3(-2) - 2y = 10$$

$$-6 - 2y = 10$$

$$-2y = 16$$

$$y = -8$$

$(-2, -8)$