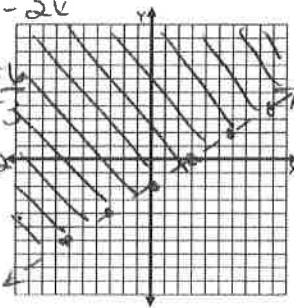
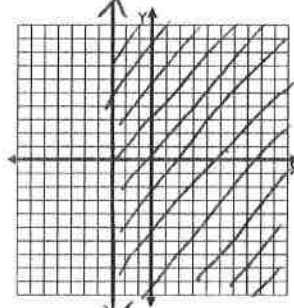
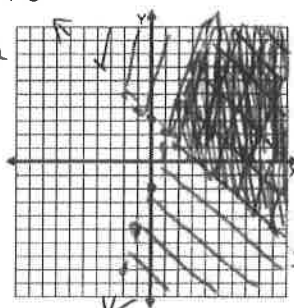
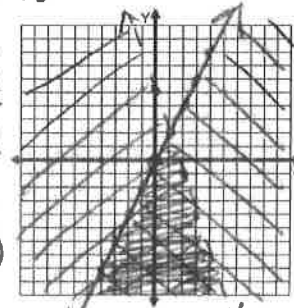


~~Unit~~ Test Study Guide

Systems of Equations & Inequalities

Systems of Equations	<p>A system of equations is <u>two (or more) linear equations</u></p> <p>The possible solutions are <u>An ordered pair (x, y) for intersecting lines, no solution (\emptyset) for parallel lines, and infinite (∞) for same line</u></p>	
Solving by Graphing	<p>1. $x + y = 2$ $x - y = 4$</p> <p>1. <u>(3, -1)</u> 2. <u>(10, 3)</u></p> <p>$y = -x + 2$ $y = x - 4$</p>	<p>2. $3x - 5y = 15$ $y = 3$</p> <p>$y = \frac{3}{5}x - 3$</p>
Solving by Substitution	<p>3. $2x + 3y = 4$ $y = 5x - 27$</p> <p>3. <u>(5, -2)</u> 4. <u>(7, 3)</u></p> <p>$2x + 3(5x - 27) = 4$ $2x + 15x - 81 = 4$ $17x - 81 = 4$ $17x = 85$ $x = 5$</p> <p>$y = 5(5) - 27$ $y = 25 - 27$ $y = -2$</p>	<p>4. $x + 4y = 19$ $x - 2y = 1 \rightarrow x = 2y + 1$</p> <p>$2y + 1 + 4y = 19$ $6y + 1 = 19$ $6y = 18$ $y = 3$</p> <p>$x = 2(3) + 1$ $x = 7$</p>
Solving by Elimination	<p>5. $x - 3y = -13$ $3x + 7y = 25$</p> <p>5. <u>(-1, 4)</u> 6. <u>∞</u> 7. <u>(2, -5)</u> 8. <u>(-3, -8)</u></p> <p>$3x - 9y = -39$ $3x + 7y = 25$ $-16y = -64$ $y = 4$</p> <p>$x - 3(4) = -13$ $x - 12 = -13$ $x = -1$</p>	<p>6. $2x + 8y = 6$ $2(5x + 20y = 15)$</p> <p>$10x + 40y = 30$ $-10x + 40y = 30$ $0 = 0$</p>
	<p>7. $7x - y = 19$ $2x - 3y = 19$</p> <p>$21x - 3y = 57$ $2x - 3y = 19$ $19x = 38$ $x = 2$</p> <p>$7(2) - y = 19$ $14 - y = 19$ $-y = 5$ $y = -5$</p>	<p>8. $4x - y = -4$ $5x = 2y + 1$</p> <p>$4x - y = -4$ $5x - 2y = 1$ $4(-3) - y = -4$ $-12 - y = -4$ $-y = 8$ $y = -8$</p> <p>$8x - 2y = -8$ $5x - 2y = 1$ $3x = -9$ $x = -3$</p>

<p>Systems Word Problems</p> <p>$x = \text{hamburgers}$ $y = \text{fries}$</p> <p>$x = \text{adults}$ $y = \text{children}$</p> <p>$x = \text{nickels}$ $y = \text{quarters}$</p>	<p>9. A tennis coach took his team out for lunch and bought 8 hamburgers and 5 fries for \$24. The players were still hungry so the coach bought 6 more hamburgers and 2 more fries for \$16.60. Find the cost of each.</p> $\begin{cases} 2(8x + 5y = 24) \rightarrow 16x + 10y = 48 \\ 5(6x + 2y = 16.60) \rightarrow 30x + 10y = 83 \end{cases}$ $\begin{array}{r} 16x + 10y = 48 \\ -30x + 10y = 83 \\ \hline -14x = -35 \\ x = 2.50 \end{array}$ <p>(hamburgers) \rightarrow $x = \\$2.50$</p> $\begin{cases} 8(2.5) + 5y = 24 \\ 20 + 5y = 24 \\ 5y = 4 \\ y = 0.80 \end{cases}$ <p>$y = \\$0.80$ (fries)</p>	
<p>10. Bob bought 24 hockey tickets for \$83. Adult tickets cost \$5.50 and child tickets cost \$2.00. How many of each did he buy?</p> $\begin{cases} 2(x + y = 24) \rightarrow 2x + 2y = 48 \\ 5.5x + 2y = 83 \end{cases}$ $\begin{array}{r} 2x + 2y = 48 \\ -5.5x + 2y = 83 \\ \hline -3.5x = -35 \\ x = 10 \end{array}$ <p>(adults) \rightarrow $x = 10$</p> $\begin{cases} x + y = 24 \\ -10 + y = 24 \\ y = 14 \end{cases}$ <p>$y = 14$ (children)</p>	<p>11. Dustin has only nickels and quarters in his piggy bank. He has 49 coins total for a combined value of \$8.85. How many of each type of coin does he have?</p> $\begin{cases} .05x + .25y = 8.85 \\ .05(x + y = 49) \end{cases}$ $\begin{array}{r} .05x + .25y = 8.85 \\ -.05x + .05y = 2.45 \\ \hline .20y = 6.4 \\ y = 32 \end{array}$ <p>$y = 32$ (qtrs)</p> $\begin{cases} x + 32 = 49 \\ -32 = -32 \\ x = 17 \end{cases}$ <p>$x = 17$ (dimes)</p>	
<p>Linear Inequalities</p>	<p>12. $2x - 3y < 6$ $-2x$ $-2x$</p> $\frac{3y < -2x + 6}{-3} \rightarrow y > \frac{2}{3}x - 2$ <p>$0 > -2$</p> <p>Yes</p> 	<p>13. $x \geq -3$</p> 
<p>Systems of Inequalities</p>	<p>14. $y < 3x - 2$ $y > -x + 3$</p> $\frac{0x < 3x - 2}{0} \rightarrow 0 < -2$ <p>NO</p> $0 > 3$ <p>NO</p> 	<p>15. $2x - y \geq 0$ $3x + y < 5$ $\star \text{ use } (1, 1)$</p> $\frac{2x - y \geq 0}{2x} \rightarrow y \leq 2x$ $\frac{3x + y < 5}{-1} \rightarrow y < -3x + 5$ <p>$1 \leq 2$</p> <p>Yes</p>  <p>$3x + y < 5$ $y < -3x + 5$ OLS</p>

Name: Key

Unit 5: Systems of Equations & Inequalities

Date: _____ Bell: _____

Homework 11: Test Review

~~This is a 2-page document.~~

Solve each system of equations by graphing. Clearly identify your solution.

1. $2x + y = 5$
 $x - y = 1$

$$y = -3x + 5$$

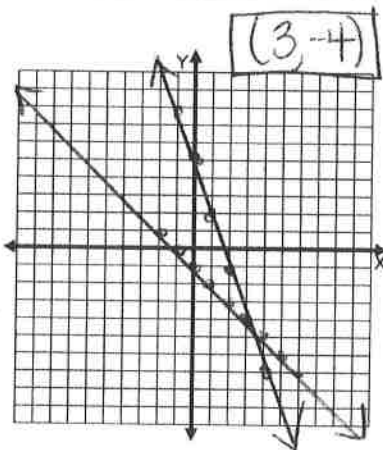
$$-x - y = 1$$

$$+x \quad +x$$

$$-y = x + 1$$

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

$$y = -x - 1$$



$(3, -4)$

2. $-4x - 2y = -8$
 $y = 2x + 4$

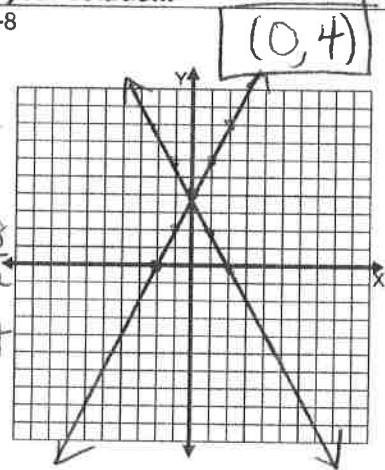
$$-4x - 2y = -8$$

$$+4x \quad +4x$$

$$-2y = 4x - 8$$

$$\frac{-2y}{-2} = \frac{4x-8}{-2}$$

$$y = -2x + 4$$



$(0, 4)$

Solve each system of equations by substitution. Clearly identify your solution.

3. $2x + 5y = -7$

$7x + y = -8 \rightarrow y = -7x - 8$

$$2x + 5(-7x - 8) = -7$$

$$2x - 35x - 40 = -7$$

$$-33x - 40 = -7$$

$$-33x = 33$$

$$x = -1$$

$$y = -7(-1) - 8$$

$$y = 7 - 8$$

$$y = -1$$

$(-1, -1)$

4. $x - 3y = -24 \rightarrow x = 3y - 24$
 $5x + 8y = -5$

$$5(3y - 24) + 8y = -5$$

$$15y - 120 + 8y = -5$$

$$23y - 120 = -5$$

$$23y = 115$$

$$y = 5$$

$$x = 3(5) - 24$$

$$x = 15 - 24$$

$$x = -9$$

$(-9, 5)$

Solve each system of equations by elimination. Clearly identify your solution.

5. $x + 2y = 3$
 $5x + 3y = 8$

$$5x + 10y = 15$$

$$-5x + 3y = 8$$

$$7y = 7$$

$$y = 1$$

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

$$x + 2 = 3$$

$$x = 1$$

$(1, 1)$

6. $2x = 8y - 2$
 $3x - 3y = 15$

$$3(2x - 8y = -2)$$

$$2(3x - 3y = 15)$$

$$6x - 24y = -6$$

$$6x - 6y = 30$$

$$-18y = -36$$

$$y = 2$$

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

$$2x - 16 = -2$$

$$2x = 14$$

$$x = 7$$

$(7, 2)$

Word Problems!



Make sure you look over the other types of problems!!

7. Mr. Wilks broke his piggy bank with a sledge hammer. It contained only quarters and pennies. He had a grand total of 120 coins that added up to 16.32. How many quarters and how many pennies did he have in his piggy bank?

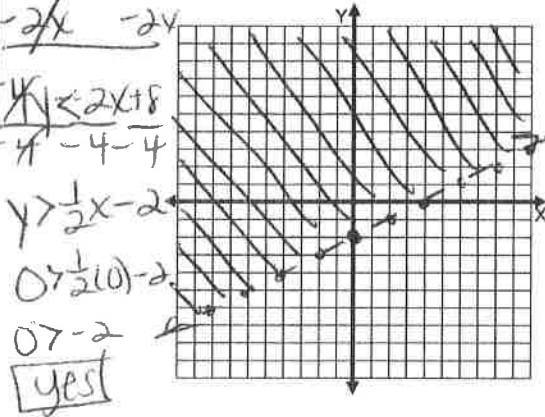
$x = \text{quarters}$ $y = \text{pennies}$

$$\begin{cases} x + y = 120 \\ .25x + .01y = 16.32 \end{cases}$$

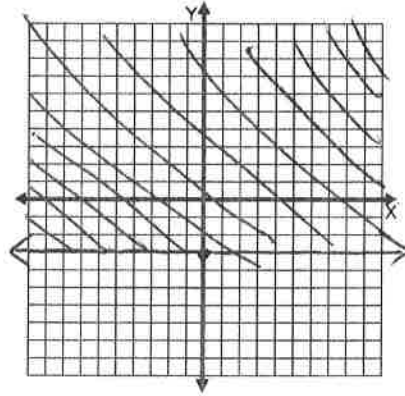
$$\begin{aligned} &\cdot 25x + .25y = 30 \\ &\cdot 25x + .01y = 16.32 \\ \hline &\cdot 24y = 13.68 \\ &\text{(pennies)} \rightarrow y = 57 \\ &\text{↑ (quarters)} \end{aligned}$$

Graph the following linear inequalities.

8. $2x - 4y < 8$

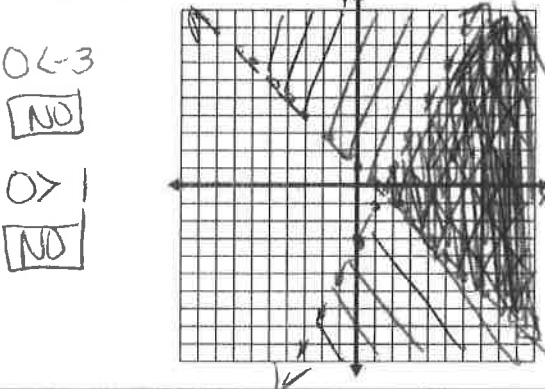


9. $y \geq -3$

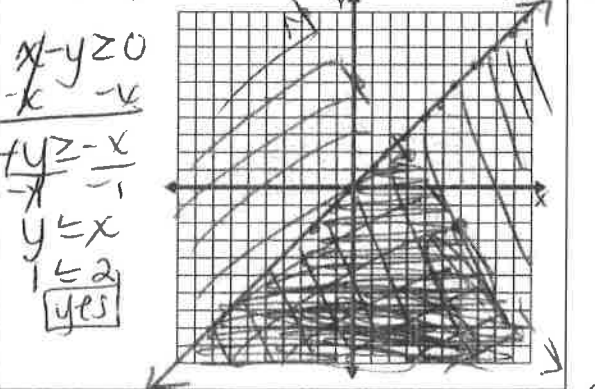


Graph the following systems of linear inequalities.

10. $y < 2x - 3$
 $y > -x + 1$



11. $x - y \geq 0$
 $4x + 3y < 18$



good luck on your test!!!! 😊

$$\begin{aligned} 4x + 3y &< 18 \\ -4x & \\ \hline 3y &< -4x + 18 \\ \frac{3y}{3} &< \frac{-4x + 18}{3} \\ y &< -\frac{4}{3}x + 6 \end{aligned}$$