Topic 4 Review Worksheet Name Key

1. Determine if each is a solution to the system.

a)(6, –2); $\begin{cases} 3x-2y=14 \\ 5x-y=32 \end{cases}$ NO

$3(6)-2(-2)\neq 14$

$18+4\neq 14$

b) (1, 3); $\begin{cases} y \leq x+2 \\ y > 4x-1 \end{cases}$ NO

$3 \leq 1+2$

$3 \leq 3$ ✓

$3 > 4(1)-1$

$3 > 3$ NO

2. Maryann and Carlos are each saving for new scooters. So far, Maryann has \$9 saved, and can earn \$6 per hour babysitting. Carlos has \$3 saved, and can earn \$9 per hour working at his family's restaurant. After how many hours of work will Maryann and Carlos have saved the same amount? What will that amount be?

$y = 9+6x$ x = # of hrs worked

$y = 3+9x$ y = total \$

$9+6x = 3+9x$

$6+6x = 9x$

$6 = 3x$

$2 = x$

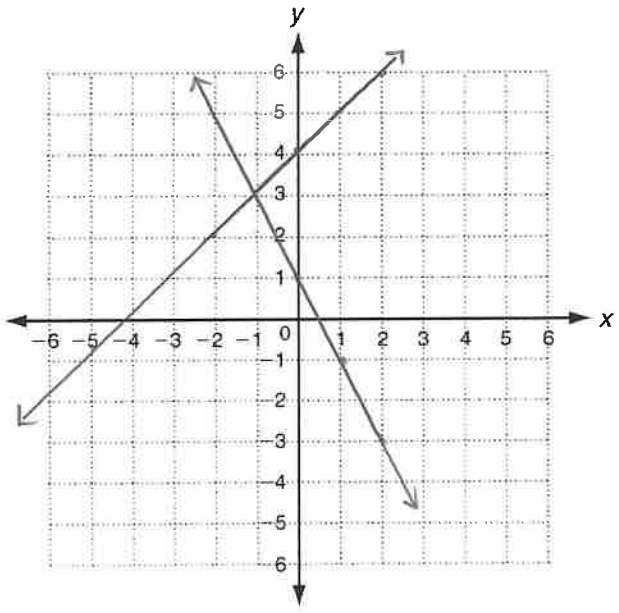
$y = 9+6(2)$

$y = 21$

At 2 hrs, they will both have \$21.

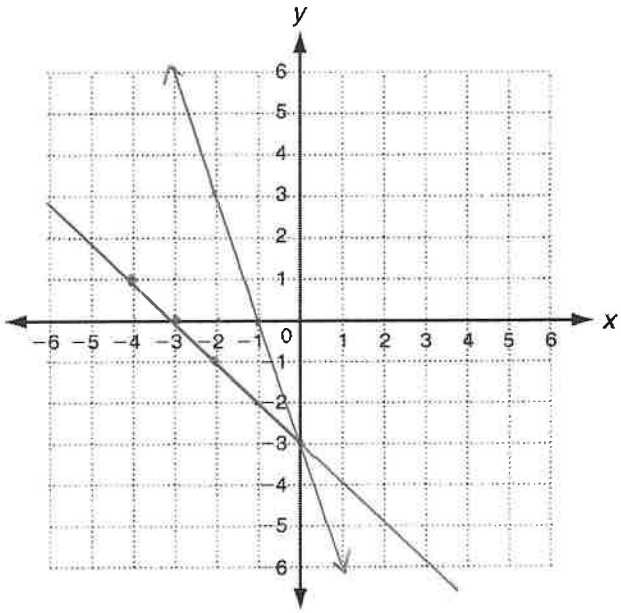
Solve by Graphing.

3. $\begin{cases} y = x+4 \\ y = -2x+1 \end{cases}$ Solution: (-1, 3)



Solve by Graphing.

4. $\begin{cases} y = -3x-3 \\ y-1 = -(x+4) \end{cases}$ Solution (0, -3)



5. Solve by **Substitution**. $\begin{cases} 4x+y=3.4 \\ x=4y \end{cases}$

$4(4y)+y=3.4$

$16y+y=3.4$

$17y=3.4$

$y=0.2$

$x=4(0.2)$

$x=0.8$

$(0.8, 0.2)$

6. Solve by **substitution**. $\begin{cases} 4x+2y=-2 \\ y=6x-5 \end{cases}$

$4x+2(6x-5)=-2$

$4x+12x-10=-2$

$16x-10=-2$

$16x=8$

$x=1/2$

$y=6(1/2)-5$

$y=3-5=-2$

$(1/2, -2)$

7. Solve by **elimination method**.

$-2\left(\begin{cases} 3x+y=17 \\ 4x+2y=20 \end{cases}\right) \rightarrow$

$-6x-2y=-34$

$4x+2y=20$

$-2x=-14$

$x=7$

$3(7)+y=17$

$21+y=17$

$y=-4$

$(7, -4)$

8. Solve by **elimination method**.

$3\left(\begin{cases} 4x-y=-5 \\ -2x+3y=10 \end{cases}\right) \rightarrow$

$12x-3y=-15$

$-2x+3y=10$

$10x=-5$

$x=-1/2$

$4(-1/2)-y=-5$

$-2-y=-5$

$-y=-3$

$y=3$

$(-1/2, 3)$

9. Prove that there are infinitely many solutions. What is special about the two equations that makes this happen? Explain.

$\begin{cases} y=2x-3 \\ y-2x=-3 \end{cases}$

$2x-3-2x=-3$

$-3=-3$ ✓

Infinite Solutions

$\mathbb{R}$

10. Prove that there are no solutions. What is special about the two equations that makes this happen? Explain.

$\begin{cases} 3x+y=4 \\ -3x=y-7 \end{cases} \rightarrow \begin{array}{l} 3x+y=4 \\ -3x-y=-7 \end{array}$

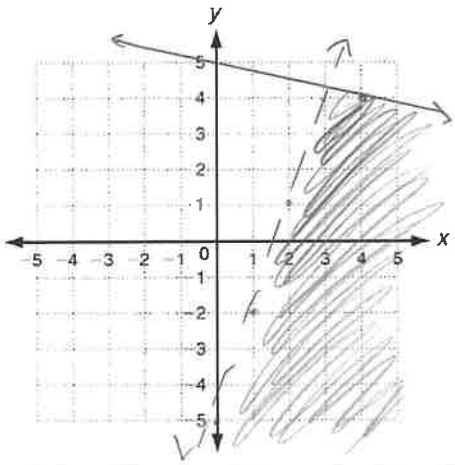
$0 \neq -3$

No Sol.

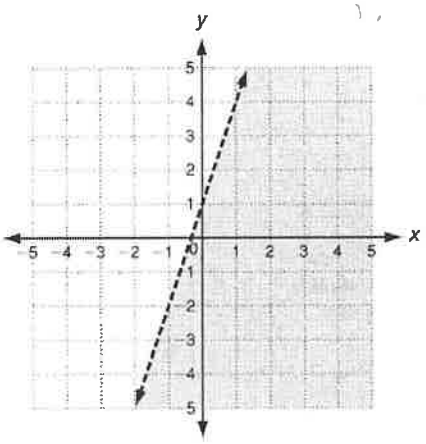
11. Graph the system of inequalities. Name two solutions to the system.

$-3x + y < -5$ → $y < 3x - 5$

$4y \leq -x + 20$ $\quad y \leq -\frac{1}{4}x + 5$



12. Write the inequality equation for the given graph.



$y < 3x + 1$

13. At a pet store, Rhonda paid $11.50 for 3 dog bowls and 4 bones. Kelly paid $13 for 2 dog bowls and 8 bones. How much are dog bowls and bones each? Write two equations and solve.

x = # of dog bowls

y = # of bones

$-2(3x + 4y = 11.50)$

$2x + 8y = 13$

$-6x - 8y = -23$

$2x + 8y = 13$

$-4x = -10$

$x = 2.50$

Dog Bowls = $2.50

Bones = $1.00

$2(2.50) + 8y = 13$

$5 + 8y = 13$

$8y = 8$

$y = 1$

14. Given the graph below. Write the inequality for each shaded region.

A: $y \geq \frac{1}{2}x + 1$

$y < -x + 3$

B: $y \geq \frac{1}{2}x + 1$

$y > -x + 3$

C: $y \leq \frac{1}{2}x + 1$

$y > -x + 3$

D: $y \leq \frac{1}{2}x + 1$

$y < -x + 3$