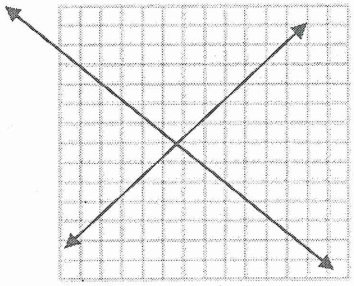
Unit 4 – Test Review Name:_____ Hr: _____

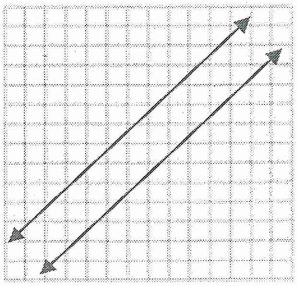
1. Describe everything you know about each system that is graphed:

a.



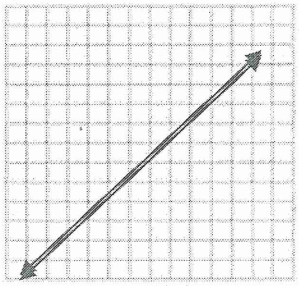
One solution

b.



- No Solution
- Lines are ||
- Lines have the same slope

c.



- Infinitely many solutions
- Two equations describing the same line

2. Is (6, 9) a solution to the system $\begin{cases} y = 3x + 1 \\ y = 2x - 5 \end{cases}$?

Why or why not?

$\begin{cases} y = 3(6)+1 = 18+1 = 19 & (6,19) \\ y = 2(6)-5 = 12-5 = 7 & (6,7) \end{cases}$

Neither line goes through the point (6,9); therefore, it cannot be a solution to the system of equations.

3. Describe what you know about the system $\begin{cases} 3x + 2y = 6 \\ y = x - 7 \end{cases}$

if (4, -3) is the solution.

If (4,-3) is the solution, then an input value of 4 in both $3x+2y=6$ and $y=x-7$ should give me an output value of -3. (The point (4,-3) is on both lines.)

4. The sum of two numbers is 16 and their difference is 8. What are the two numbers? Show how a system of equations can be used to find the numbers.

$$\begin{cases} x + y = 16 \\ x - y = 8 \end{cases}$$

$+$

$2x = 24$

$\frac{2x}{2} = \frac{24}{2}$

$*x = 12$

$(12) + y = 16$

$-12 \quad -12$

$*y = 4$

$(12, 4)$

5. Solve each system by elimination:

$\begin{cases} x + y = -3 \\ 2x - 3y = -11 \end{cases}$ $\cdot 2$

$2x + 2y = -6$
$-\ 2x - 3y = -11$
$0x \quad 5y = 5$
$y = 1$

$x + (1) = -3$
$-1 \quad -1$
$x = -4$

$(-4, 1)$

$\begin{cases} 4x + 5y = 3 \\ 2x + 5y = -11 \end{cases}$

$-$

$2x + 0y = 14$
$\frac{2x}{2} = \frac{14}{2}$
$x = 7$

$2(7) + 5y = -11$
$14 + 5y = -11$
$-14 \qquad -14$
$\frac{5y}{5} = \frac{-25}{5}$
$y = -5$

$(7, -5)$

$x - 3y = 2$
$-x + 2y = -3$

$-y = -1$
$y = 1$
$x - 3(1) = 2$
$x - 3 = 2$
$x = 5$

$(5, 1)$

$4x - y = 5$
$3x + y = 9$

$7x = 14$
$\frac{7x}{7} = \frac{14}{7}$
$x = 2$
$3(2) + y = 9$
$6 + y = 9$
$y = 3$

$(2, 3)$

$2x - 5y = -7$
$-2x + 3y = 1$

$-2y = -6$
$\frac{-2y}{-2} = \frac{-6}{-2}$
$y = 3$
$2x - 5(3) = -7$
$2x = 8$
$x = 4$

$(4, 3)$

6. Solve each system by substitution:

$\begin{cases} x + 3y = 12 \\ x - y = 4 \end{cases}$

$x = y + 4$
$(y+4) + 3y = 12$
$4y + 4 = 12$
$-4 \quad -4$
$4y = 8$
$y = 2$

$x - 2 = 4$
$x = 6$

$(6, 2)$

$\begin{cases} x + 4y = 1 \\ 2x + 7y = 6 \end{cases}$

$x = -4y + 1$
$2(-4y + 1) + 7y = 6$
$-8y + 2 + 7y = 6$
$-y + 2 = 6$
$-2 \quad -2$

$x + 4(-4) = 1$
$x - 16 = 1$
$x = 17$
$-y = 4$
$y = -4$

$(17, -4)$

$-x + y = 9$
$x + 2y = 6$

$2x - 3y = 9$
$5x + 3y = 12$

$-4x - y = 11$
$4x + 4y = -20$

7. The Free State Frisbee club sold Free State Frisbees to raise money. Green discs with the words Free State engraved on them sold for \$4 each, and custom made discs with the Firebird emblem engraved on them sold for \$20 each. On the first day of sales, the club had sold 38 Frisbees and earned \$200. How many Frisbees of each type were sold on the first day?

x: G \$4/ea
y: Custom \$20/ea

$x + y = 38$
$4x + 20y = 200$

$y = 38 - x$

$4x + 20(38 - x) = 200$
$4x + 760 - 20x = 200$
$-16x = -560$
$x = 35$

$35 + y = 38$
$y = 3$

$(35, 3)$