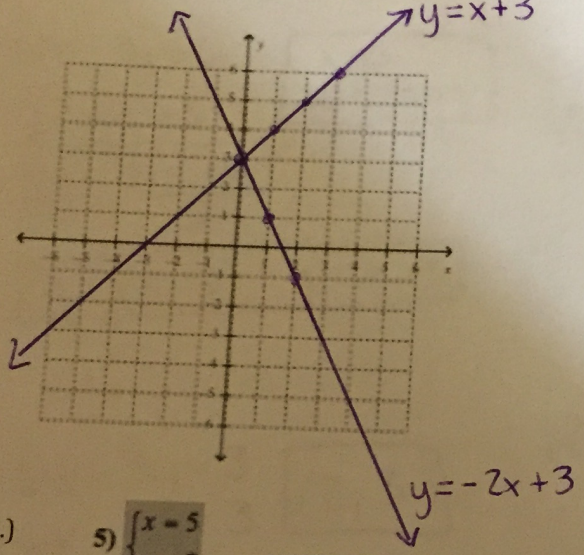
Name: Key Period: _____

Systems: Solving Algebraically and Graphing Review

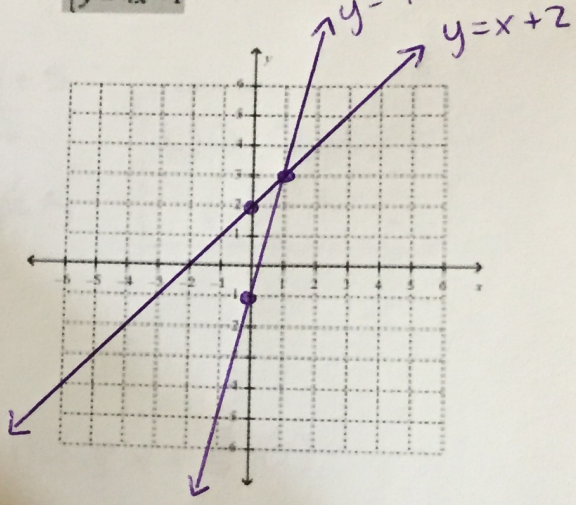
1.) Name the most important characteristic of a system.

Solve the following systems by graphing.

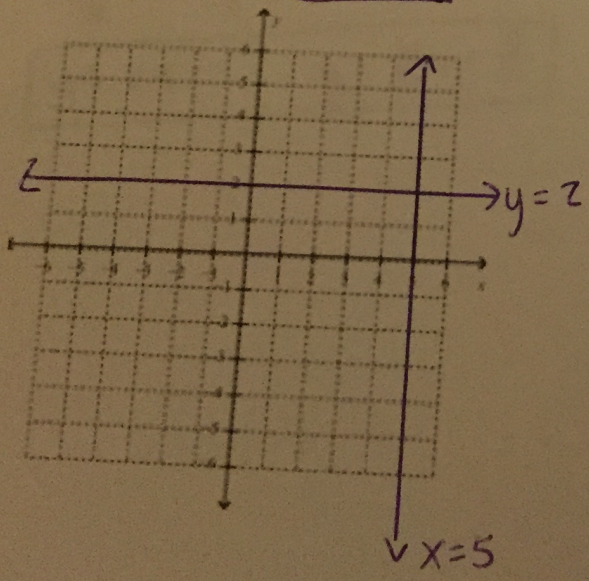
2.) 1) $\begin{cases} y = x + 3 \\ y = -2x + 3 \end{cases}$ (0,3)



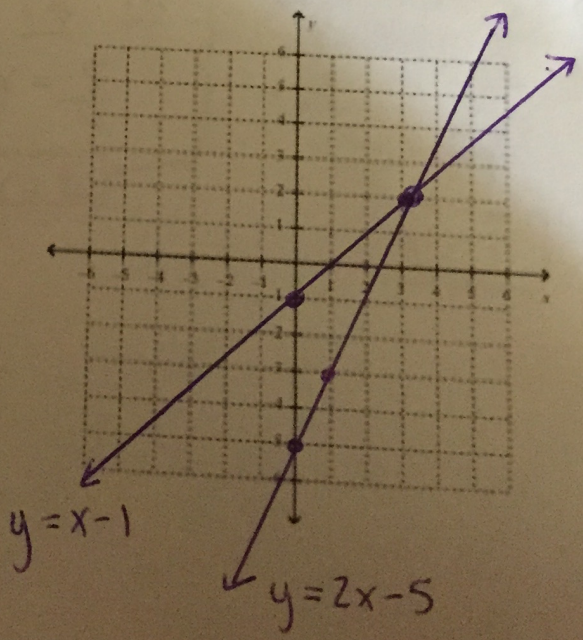
3.) 2) $\begin{cases} y = x + 2 \\ y = 4x - 1 \end{cases}$ (1,3)



4.) 5) $\begin{cases} x = 5 \\ y = 2 \end{cases}$ (5,2)



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



Identify without graphing if each system will have one solution, no solution, or infinitely many solutions.

6.) $\begin{cases} x + y = 1 \\ x + y = 5 \end{cases}$ Same slope Diff y-int → NO solution (parallel lines)

7.) $(2)\left(\frac{1}{2}x + 3y\right) = (1)(2)$

$x + 6y = 2$ ✓

$x + 6y = 2$ ✓

Same slope same y-int → infinitely many (same line)

Solve each system algebraically. (Work on next page)

9.) $\begin{cases} x + 3y = 11 \\ 2x + 3y = 4 \end{cases}$ (-7, 6)

10.) $\begin{cases} 6x - 3y = 6 \\ y = 2x + 5 \end{cases}$ NO Solution

11.) $\begin{cases} 6x - 3y = 3 \\ -6x + 5y = 3 \end{cases}$ (2, 3)

12.) At a recreation and sports facility, 3 members and 3 nonmembers pay a total of $180 to take an aerobics class. A group of 5 members and 3 nonmembers pay $210 to take the same class. How much does it cost members and nonmembers to take an aerobics class?

non = 45 mem = 15

13.) Marcello is an artist who makes oil paintings and charcoal sketches. He sells each oil painting for $500 and each charcoal sketch for $300. If Marcello wants to create 56 works in total, how many pieces of artwork must he sell in order to make exactly $20,000?

sketch = 40 painting = 16

9) $x+3y=11$
$2x+3y=4$

$(-7,6)$

$\frac{3y}{3}=\frac{-x+11}{3}$ $\quad$ $\frac{3y}{3}=\frac{-2x+4}{3}$

$y=-\frac{1}{3}x+\frac{11}{3}$ $\quad$ $y=-\frac{2}{3}x+\frac{4}{3}$

$(3)\left(-\frac{1}{3}x+\frac{11}{3}\right)=\left(\frac{2}{3}x+\frac{4}{3}\right)(3)$

$-x+11=-2x+4$
$+2x \quad +2x$

$x+11=4$
$-11 \quad -11$

$x=-7$

$x+3y=11$
$(-7)+3y=11$
$+7 \quad +7$

$\frac{3y}{3}=\frac{18}{3}$

$y=6$

10) $6x-3y=6$
$y=2x+5$

NO solution

$\frac{-3y}{-3}=\frac{-6x+6}{-3}$

$y=2x-2$ $\quad$ $y=2x+5$

$2x-2=2x+5$
$-2x \quad -2x$

$-2\neq 5$

NO solution
(// lines)

11) $6x-3y=3$
$-6x+5y=3$

$(2,3)$

$\frac{-3y}{-3}=\frac{-6x+3}{-3}$ $\quad$ $\frac{5y}{5}=\frac{6x+3}{5}$

$y=2x-1$ $\quad$ $y=\frac{6}{5}x+\frac{3}{5}$

$(5)(2x-1)=\left(\frac{6}{5}x+\frac{3}{5}\right)(5)$

$10x-5=6x+3$
$-6x \quad -6x$

$4x+-5=3$
$+5 \quad +5$

$\frac{4x}{4}=\frac{8}{4}$

$x=2$

$6x-3y=3$
$6(2)-3y=3$
$12-3y=3$
$-12 \quad -12$

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

$y=3$

12.) $3m + 3n = 180$
$5m + 3n = 210$

m = # of members
n = # of nonmembers

$\frac{3m}{3} = \frac{-3n + 180}{3}$

$\frac{5m}{5} = \frac{-3n + 210}{5}$

$m = -n + 60$

$m = -\frac{3}{5}n + 42$

$(5)(-n + 60) = (-\frac{3}{5}n + 42)(5)$

$-5n + 300 = -3n + 210$
$+5n \qquad +5n$

$300 = 2n + 210$
$-210 \qquad -210$

$90 = 2n$

$\frac{90}{2} = \frac{2n}{2}$

$n = 45$

$3m + 3n = 180$
$3m + 3(45) = 180$
$3m + 135 = 180$
$-135 \quad -135$

$\frac{3m}{3} = \frac{45}{3}$

$m = 15$

There are 45 nonmembers and 15 members.

13) $p + s = 56$
$500p + 300s = 20000$

p = # of oil paintings
s = # of charcoal sketches

$p = -s + 56$
$p = -\frac{3}{5}s + 40$

$\frac{500p}{500} = \frac{-300s + 20000}{500}$

$(5)(-s + 56) = (-\frac{3}{5}s + 40)(5)$

$-5s + 280 = -3s + 200$
$+5s \qquad +5s$

$280 = 2s + 200$
$-200 \qquad -200$

$\frac{80}{2} = \frac{2s}{2}$

$s = 40$

$p + s = 56$
$p + 40 = 56$
$-40 \quad -40$

$p = 16$

He must sell 16 paintings and 40 sketches