CCSS Algebra 1 AA3 Systems Notes Name_____

I can determine whether or not a coordinate point is a SOLUTION to a SYSTEM.

(0, 5) is a SOLUTION to
$-3x+2y=10$
$y=\frac{1}{4}(x+8)+3$ because

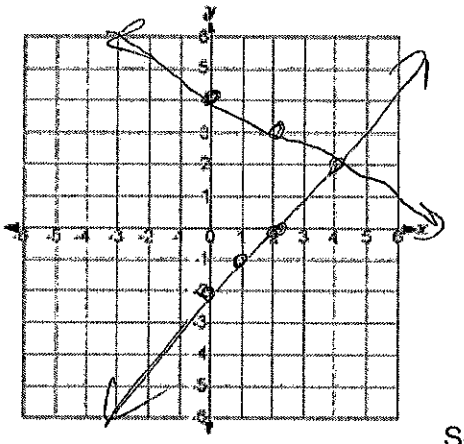
$-3(0)+2(5)=10$

AND

$5=\frac{1}{4}(0+8)+3$

I can GRAPH a SYSTEM to determine the SOLUTION.

Solve the system by GRAPHING:
$y=x-2$
$y=-\frac{1}{2}x+4$



Solution (4, 2)

I can use the EQUAL VALUES METHOD to find the SOLUTION to a SYSTEM.

For the SYSTEM shown,
$x=-3y-8$
$x=2y+27$
1. The 1st Step to solving is to make

$\frac{-3y-8}{-2y}=\frac{2y+27}{-2y}$

$-5y-8=27$
$+8\quad+8$

$\frac{-5y}{-5}=\frac{35}{-5}$

$y=-7$

$x=-3(-7)-8=21-8=13$
$x=2(-7)+27=-14+27=13$

2. The SOLUTION to the SYSTEM is

x = 13 and y = −7 or (13, −7)

I can use SUBSTITUTION to find the SOLUTION to a SYSTEM.

For the SYSTEM shown,
$5x-3y=29$
$y=-2x+5$
1. The 1st Step to solving is by replacing the y in $5x-3y=29$ with $-2x+5$

$5x-3(-2x+5)=29$
$5x+6x-15=29$
$11x-15=29$
$+15\quad+15$
$\frac{11x}{11}=\frac{44}{11}$
$x=4$

$y=-2(4)+5=-8+5=-3$

$5(4)-3(-3)\stackrel{?}{=}29$
$20+9=29$

2. The SOLUTION to the SYSTEM is

x = 4 and y = −3 or (4, −3)

I can use ELIMINATION to find the SOLUTION to a SYSTEM.

For the SYSTEM shown,

$2x - 3y = -10$

$4x + 3y = -20$

1. If I ADD the two equations together, the $3y$ will be eliminated and the equation will become

$6x = -30 \rightarrow x = -5$

2. Once I find the value of x, I can find y by solving the equation $2(-5) - 3y = -10$

$-10 - 3y = -10$

$+10 \quad +10$

$-3y = 0 \rightarrow y = 0$

Check: $4(-5) + 3(0) \stackrel{?}{=} -20$

$-20 + 0 = -20$

3. The SOLUTION to the SYSTEM is

x = -5 and y = 0 or $(-5, 0)$

I can use ELIMINATION with MULTIPLICATION to find the SOLUTION to a SYSTEM.

For the SYSTEM shown,

$2x - 3y = -10$

$4x + 5y = -20$

1. The 1st Step to solving is to MULTIPLY $2x - 3y$ by 2. $\rightarrow 4x - 6y = -20$

2. The 2nd Step to solving is: Subtract Top & Bottom

$4x - 6y = -20$

$-(4x + 5y = -20)$

$-11y = 0 \rightarrow y = 0$

$2x - 3(0) = -10$

$2x - 0 = -10$

$2x = -10 \rightarrow x = -5$

Check: $4(-5) + 5(0) = -20$

$-20 + 0 = -20$

3. The SOLUTION to the SYSTEM is

x = -5 and y = 0 or $(-5, 0)$

I can determine is a SYSTEM has NO SOLUTION or an INFINITE NUMBER OF SOLUTIONS.

1. If a SYSTEM has NO SOLUTION, the graphs of the two lines in the SYSTEM are parallel.
2. If a SYSTEM has an INFINITE NUMBER OF SOLUTIONS, the graphs of the two lines in the SYSTEM are Identical or Coincident.
3. If a SYSTEM has NO SOLUTION, using EQUAL VALUES, SUBSTITUTION or ELIMINATION will result in an equation like $5 = 4$.
4. If a SYSTEM has an INFINITE NUMBER OF SOLUTIONS, using EQUAL VALUES, SUBSTITUTION or ELIMINATION will result in an equation like $5 = 5$.

Extra Practice:

1. $y = -5x + 2$ **and** $y = 2x + 16$

$-5x + 2 = 2x + 16$

$-2x \quad -2 \quad -2x \quad -2$

$-7x = 14$

$-7 \quad -7$

$x = -2$

$y = -5(-2) + 2$

$y = 10 + 2$

$y = 12$

2. $4x + 6y = 62$ **and** $y = x + 2$

$4x + 6(x + 2) = 62$

$4x + 6x + 12 = 62$

$10x + 12 = 62$

$10x = 50 \rightarrow x = 5$

$y = 5 + 2$

$y = 7$

3. $3x - 5y = -19$ **and** $5x - y = 5$ $\cdot 5$

$-(25x - 5y = 25)$

$-22x = -44$

$-22 \quad -22$

$x = 2$

$3(2) - 5y = -19$

$6 - 5y = 19$

$-6 \quad -6$

$-5y = -25$

$-5 \quad -5$

$y = 5$