Linear Systems: <u>SUBSTITUTION METHOD</u> Guided Notes

Steps for solving systems using SUBSTITUTION:

- Step 1: Isolate one of the variables.
- <u>Step 2</u>: Substitute the expression from Step 1 into the OTHER equation.
 - The resulting equation should have only one variable, not both *x* and *y*.
- Step 3: Solve the new equation.
 - This will give you one of the coordinates.
- <u>Step 4</u>: Substitute the result from Step 3 into either of the original equations.
- Step 5: Solve for the other coordinate.
- Step 6: Write the solution as an ordered pair. (x, y)

y = 2x - 1	
Example: b) $3x + 2y = 26$	5
• <u>Step 1</u> : Isolate one of the	• <u>Step 1</u> : Equation a already has y isolated.
variables.	
• <u>Step 2</u> : Substitute the expression	
from Step 1 into the OTHER	3x + 2(2x - 1) = 26
equation.	• <u>Step 3</u> : $3x + 4x - 2 = 26$
• The resulting equation should	7x - 2 = 26
have only one variable, not	+2 +2
both <i>x</i> and <i>y</i> .	$\underline{7x = 28}$
• Step 3: Solve the new equation.	7 7
• This will give you one of the	$\mathbf{x} = 4$
coordinates.	• <u>Step 4</u> : $y = 2(4) - 1$
• <u>Step 4</u> : Substitute the result from	
Step 3 into either of the original	• <u>Step 6</u> : (4, 7)
equations.	
• <u>Step 5</u> : Solve for the other	
coordinate.	
• Step 6: Write the solution as an \bullet	
ordered pair. (x, y)	

Example: a) $-4x + y = 6$	
b) $-5x - y = 21$	
• <u>Step 1</u> : Isolate one of the	• Step 1: Isolate Equation a because y has a
variables.	coefficient of positive 1.
• <u>Step 2</u> : Substitute the expression	-4x + y = 6
from Step 1 into the OTHER	+4x $+4x$
equation.	y = 6 + 4x
• The resulting equation should	
have only one variable, not	
both x and y .	-5x - (6 + 4x) = 21
• Step 3: Solve the new equation.	• <u>Step 3</u> : $-5x - 6 - 4x = 21$
• This will give you one of the	-9x - 6 = 21
coordinates.	+6 + 6
• Step 4: Substitute the result from \bullet	-9x = 27
Step 3 into either of the original	-9 -9
equations.	$\mathbf{x} = -3$
• Step 5: Solve for the other	• <u>Step 4</u> : $y = 6 + 4$ (-3)
coordinate.	
• Step 6: Write the solution as an \bullet	• <u>Step 6</u> : (-3, -6)
ordered pair. (x, y)	