Name: _____ Date: _____

5-2 Systems of Equations – Algebraically Ms. Moser

Solving System of Equations by Substitution

Main Ideas/Questions	Notes	
WHAT IS IT?	An algebraic method for solving systems of equations by substituting equations within each other.	
STEPS TO SOLVE	**1.** Solve one equation for x or y.	Pick the easier equation. The goal is to get x or y by itself!
	2. Substitute!	Substitute this expression into the other equation. SOLVE for the variable!
	3. Solve the equation!	Get the variable by itself!
	4. Plug back in to find the other variable.	Substitute your answer into the revised equation from Step 1 & SOLVE for the other variable!
	5. Check your solution!	Substitute your ordered pair into BOTH equations.

Examples: Solve the following systems using **substitution.**

1.) $x + y = 5$
$y = 3 + x$

$x + 1(3 + x) = 5$
$x + 3 + x = 5$
$2x + 3 = 5$
$-3 \quad -3$
$\frac{2x}{2} = \frac{2}{2}$
$x = 1$

$y = 3 + x$
$y = 3 + 1$
$y = 4$

Solution (1, 4)

2.) Which answer 'checks' correctly for the following system: $\begin{cases} 3x - y = 4 \\ x = 4y - 17 \end{cases}$

(a) (2, 2) (x, y)
$3(2) - (2) = 4$
$6 - 2 = 4$
$4 = 4$
$2 = 4(2) - 17$
$2 = 8 - 17$
$2 \neq -9$ NO

(b) (5, 3) (x, y)
$3(5) - (3) = 4$
$15 - 3 = 4$
$12 \neq 4$ NO
$2 = 4(3) - 17$
$2 = 12 - 17$
$2 \neq -5$

(c) (3, 5) (x, y)

(d) (3, -5) (x, y)