Name: Key	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
Solve by Elimination	① **LINE UP** the equations.
	② **MULTIPLY** one or both equations by a number to result in a variable with the same coefficient.
	③ **ADD or SUBTRACT** the equations to eliminate this variable.
	④ **SOLVE** for the remaining variable.
	⑤ **SUBSTITUTE** your answer from step 4 into either original equation to find the other variable.

Directions: Solve each system of equations below by elimination. Identify the solution.

1. $x + 7y = 17$
$-(x - y = -7)$
$\overline{\qquad\qquad}$
$8y = 24$
$y = 3$

$x - 3 = -7$
$x = -4$

$\boxed{(-4, 3)}$

2. $3x + 2y = 22$
$+\ 5x - 2y = 42$
$\overline{\qquad\qquad}$
$8x = 64$
$x = 8$

$3(8) + 2y = 22$
$24 + 2y = 22$
$2y = -2$
$y = -1$

$\boxed{(8, -1)}$

3. $4x - 9y = -42$
$-4(x + 5y = 4)$
$\underline{\qquad\qquad}$
$4x - 9y = -42$
$+\ -4x - 20y = -16$
$\overline{\qquad\qquad}$
$-29y = -58$
$y = 2$

$x + 5(2) = 4$
$x + 10 = 4$
$x = -6$

$\boxed{(-6, 2)}$

4. $7x - 6y = -53$
$(2x - 3y = -13) \cdot -2$
$\underline{\qquad\qquad}$
$7x - 6y = -53$
$+\ -4x + 6y = 26$
$\overline{\qquad\qquad}$
$3x = -27$
$x = -9$

$2(-9) - 3y = -13$
$-18 - 3y = -13$
$-3y = 5$
$y = \frac{-5}{3}$

$\boxed{\left(-9, \frac{-5}{3}\right)}$

5. $(5x + 3y = -7)\ 2$
$(2x + 7y = 3)\ -5$
$\underline{\qquad\qquad}$
$10x + 6y = -14$
$+\ -10x - 35y = -15$
$\overline{\qquad\qquad}$
$-29y = -29$
$y = 1$

$5x + 3(1) = -7$
$5x + 3 = -7$
$5x = -10$
$x = -2$

$\boxed{(-2, 1)}$

6. $(3x - 9y = 9)\ 4$
$(4x - 12y = 36)\ -3$
$\underline{\qquad\qquad}$
$12x - 36y = 36$
$+\ -12x + 36y = -108$
$\overline{\qquad\qquad}$
$0 \neq -72$

$\boxed{\text{No Solution}}$

7. $5x - 6y = 3$

$\quad\; 7y = 2x + 8$

$(\; 5x - 6y = 3\;)2$

$(-2x + 7y = 8\;)5$

$\overline{}$

$10x - 12y = 6$

$+ -10x + 35y = 40$

$\overline{}$

$\qquad 23y = 46$

$\qquad\;\; y = 2$

$5x - 6(2) = 3$

$5x = 15$

$\;\; x = 3$

$\boxed{(3, 2)}$

8. $10x + 18 = -8y$

$\quad\; 4 + 9x = 5y$

$(10x + 8y = -18)5$

$(9x - 5y = -4)8$

$\overline{}$

$50x + 40y = -90$

$+ 72x - 40y = -32$

$\overline{}$

$122x = -122$

$\quad\; x = -1$

$10(-1) + 18 = -8y$

$8 = -8y$

$-1 = y$

$\boxed{(-1, -1)}$

Applications	①	DEFINE YOUR VARIABLES – What are you solving for?
	②	SET UP TWO EQUATIONS using the information given.
	③	SOLVE the system using your method of choice.

9. Marcie bought a total of 20 used books and CDs during a yard sale for a total of $54.50. If books costs $1.50 each and CDs cost $5 each, how many of each did she buy?

$b = $ books

$c = $ cd's

$b + c = 20$

$1.50b + 5c = 54.50$

$-5b - 5c = -100$

$+ \; 1.50b + 5c = 54.50$

$\overline{}$

$-3.5b = -45.50$

$b = 13$

$\boxed{13 \text{ books and } 7 \text{ CDs}}$

10. Landon babysits and works part time at the water park over the summer. One week, he babysat for 3 hours and worked at the water park for 10 hours and made $109. The next week he babysat for 8 hours and worked at the water park for 12 hours and made $177. How much does Landon make per hour at each job?

$b = $ babysits

$w = $ waterpark

$(3b + 10w = 109)8$

$(8b + 12w = 177)-3$

$24b + 80w = 872$

$+ -24b - 36w = -531$

$\overline{}$

$44w = 341 \qquad w = 7.75$

$3b + 10(7.75) = 109$

$3b = 31.5$

$b = 10.5$

$\boxed{\$10.50 \text{/hr babysitting and } \$7.75\text{/hr at the waterpark.}}$

11. Kent has a collection of pennies and nickels with a value of $1.98. The number of pennies he has is five less than twice the number of nickels. How many of each coin does Kent have?

$p = $ pennies

$n = $ nickels

$.01p + .05n = 1.98$

$p = 2n - 5$

$.01(2n - 5) + .05n = 1.98$

$.02n - .05 + .05n = 1.98$

$.07n = 2.03 \qquad n = 29$

$p = 2(29) - 5$

$p = 53$

$\boxed{53 \text{ pennies + } 29 \text{ nickels}}$