When you are done with your 4.3 homework you should be able to…

- Solve linear systems by the addition method
- Use the addition method to identify systems with no solution or infinitely many solutions
- Determine the most efficient method for solving a linear system

WARM-UP:

1. Solve the following system of linear equations by substitution. State whether the system is consistent or inconsistent. For those systems that are consistent, state whether the equations are dependent or independent.

$$y = \frac{7}{2}x - 3$$
$$y = -4x + 2$$

ELIMINATING A VARIABLE USING THE ADDITION METHOD

The _____ method is most useful if one of the equations has an _____ variable. A third method for solving a linear system is the _____ method. The addition method _____ a variable by _____ the equations. When we use the addition method, we want to obtain two equations whose _____ is an equation containing only _____ variable. The key step is to obtain, for one of the variables,

_____ that differ only in _____.

Steps for Solving a System of Two Linear Equations Containing Two Variables by Addition

1. If necessary, _____ both equations in the form _____.
2. If necessary, _____ either equation or both equations by appropriate nonzero numbers so that the _____ of the x-coefficients or y-coefficients is _____.
3. _____ the equations in step 2. The _____ is an _____ in _____ variable.
4. _____ the equation in one variable.
5. _____-_____ the value obtained in step 4 into either of the _____ equations and _____ for the other variable.
6. _____ the solution in _____ of the original equations.

Example 1: Solve the following systems of linear equations by the addition method. State whether the system is consistent or inconsistent. For those systems that are consistent, state whether the equations are dependent or independent. Use set notation to express solution sets.

a.

$$x + y = 6$$
$$x - y = -2$$

b.

$$3x - y = 11$$
$$2x + 5y = 13$$

COMPARING SOLUTION METHODS

METHOD	ADVANTAGES	DISADVANTAGES
GRAPHING	You can _____ the _____.	If the solutions do not involve _____ or are too _____ or _____ to be _____ on the graph, it's impossible to tell exactly what the _____ are.
SUBSTITUTION	Gives _____ solutions. Easy to use if a _____ is on _____ side by itself.	Solutions cannot be _____. Can introduce extensive work with _____ when no variable has a coefficient of _____ or _____.
ADDITION	Gives _____ solutions. Easy to use!	Solutions cannot be _____.

Example 2: Solve the following systems of linear equations by any method. State whether the system is consistent or inconsistent. For those systems that are consistent, state whether the equations are dependent or independent. Use set notation to express solution sets.

a.

$$x + y = 6$$
$$x - y = -2$$

b.

$$3x - y = 11$$
$$2x + 5y = 13$$

c.

$$4x - 2y = 2$$
$$2x - y = 1$$

d.

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

e.

$$2x + 4y = 5$$
$$3x + 6y = 6$$