Using the Combination Method

A. Use the combination method to solve these linear systems.

1. $\begin{cases} -x + 4y = 3 \\ x + 2y = 5 \end{cases}$ **2.** $\begin{cases} 2x + 3y = 4 \\ 5x + 3y = -8 \end{cases}$ **3.** $\begin{cases} 2x - 3y = 4 \\ 5x - 3y = 7 \end{cases}$

B.

1. Explain why System B is equivalent to System A.

System A	System B
$\begin{cases} 3x + 2y = 10 \\ 4x - y = 6 \end{cases}$	$\begin{cases} 3x + 2y = 10 \\ 8x - 2y = 12 \end{cases}$

2. Rewriting System A as System B is a possible first step in solving the system by the combination method. Complete this solution process by combining the two equations in System B.

C.

1. Add the two equations in System A. Graph both equations in System A and the new equation you made by adding. What do the three equations have in common?

2. Graph System B and the new equation you made by adding. What do the three equations have in common?

3. Why does the graph you made with System B and the new equation help to solve the system?

D. In parts (1) and (2), write an equivalent system that is easy to solve by combining equations. Then find the solution. Check your work by solving the system with a different method, mentioning the method used.

1. $\begin{cases} 2x + 2y = 5 \\ 3x - 6y = 12 \end{cases}$ **2.** $\begin{cases} x + 3y = 4 \\ 3x + 4y = 2 \end{cases}$

E.

1. Decide whether equivalent form, substitution, or combination would be easiest for solving the system. Then, solve the system.

a. $\begin{cases} 2x + y = 5 \\ 3x - y = 15 \end{cases}$ **b.** $\begin{cases} x + 2y = 5 \\ x - 6y = 11 \end{cases}$ **c.** $\begin{cases} 2x + 6y = 7 \\ 3x - 2y = 5 \end{cases}$

d. $\begin{cases} 2x + y = 5 \\ -4x - 2y = -10 \end{cases}$ **e.** $\begin{cases} x + 2y = 5 \\ 3x + 6y = 15 \end{cases}$

2. For each system in part (1), explain how you decided which solution method to use.

F. Two of the systems in Question E did not have single solutions. How could you have predicted this before you started to solve them?