# PIPS – Linear Systems

1. Examine the system below. Which algebraic method (*elimination* or *substitution*) would you use to solve the system? **Explain your reasoning** to your group members. Have half your group solve the system using one algebraic method and the other half of the group solve using the other algebraic method. Did you arrive at the same answer?

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

2. Construct a system of two linear equations where $(0, 5)$ is a solution to the first equation but is not a solution to the second equation and $(3, 8)$ is the solution to the system. Graph the system in order to justify that the system you created satisfies the given conditions.
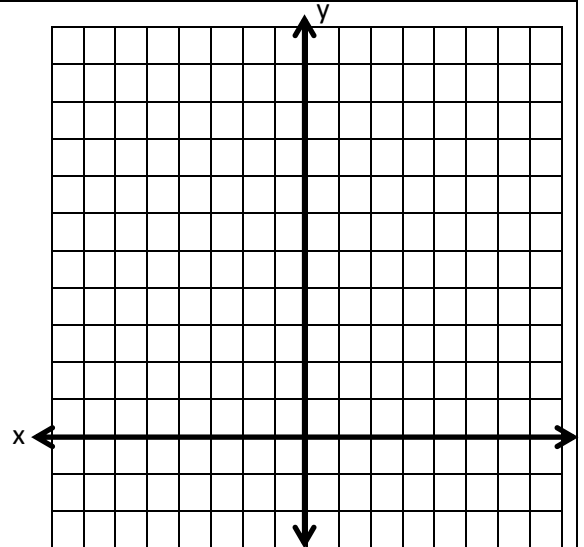
3. Solve each system below <u>algebraically</u>. Describe the solution set. Describe what each system looks like <u>graphically</u>.

   a) $2y – 2x = 6$
   $3y – 3x = 9$

   b) $2x = y – 4$
   $3y = 6x$

4. At a state fair, there is a game where you throw a ball at a pyramid of cans. If you knock over all the cans, you win a prize. The cost is 3 throws for $1, but if you have an armband, you get 6 throws for $1. The armband is purchased at the entrance for $10.

a) Complete the table below that compares the cost of playing the game with an armband and without an armband.

x Number of throws	y Cost without armband	y Cost with armband
0		
6		
12		
18		
24		
30		
36		
42		
48		
54		
60		
66		
72		
78		

b) Does it make sense to buy the armband if you want to play this game? **Explain** your reasoning.

c) Write a system of equations that models the situation.

   Without Armband: _____

   With Armband: _____

   What is the meaning of the rate of change (slope) and y-intercept in each equation?

d) What is the solution to the system? What does it mean in the context of the situation?