## **Linear Systems**

The graph shows two lines that intersect at one point.

- a) What are the approximate coordinates of the point of intersection?
- b) Is the point the solution to the equations of both lines?



c) Is there a better way to solve this system?

## Solve by Substitution

Example 1: Find the solution to the system  $\begin{cases} x = 3 - 2y \\ x - 2y = 4 \end{cases}$ 

Example 2: Find the solution to the system  $\begin{cases} y = -2x - 1\\ 5y - 6x = 7 \end{cases}$ 

Example 3: Find the solution to the system  $\begin{cases} 4x - 3y = 4 \\ x = 2y - 5 \end{cases}$ 

## Solve by Elimination

Example 4: Find the solution to the system  $\begin{cases} 2x + 6y = 10 \\ -3x - 6y = 9 \end{cases}$ 

Example 5: Find the solution to the system  $\begin{cases} 3x + 2y = 5\\ x + 4y = -10 \end{cases}$ 

Example 6: Solve  $\begin{cases} -4y - 11x = 36\\ 20 = -10x - 10y \end{cases}$ 

Example 7: Write a system of linear equations that has the solution shown.

a) (-3,5)





**Systems of Linear Inequalities** 

Malcolm earns \$20 per hour mowing lawns and \$10 per hour walking dogs. His goal is to earn at least \$200 each week, but he can work a maximum of 20 h per week. Malcolm must spend at least 5 h per week walking his neighbors' dogs. For how many hours should Malcolm work at each job in order to meet his goals?



2. Graph the set of all points that solve this system of linear inequalities.

	$2x + y \le 14$
J	$x + 2y \leq 10$
	$x \ge 0$
	$y \ge 0$

3. Graph the set of all points that solve this system of linear inequalities:

ſ	y	≥	16	-	2 <i>x</i>
ł	y	≤	16	-	x
l	y	≥	6		