

# Algebra I

## Notes Section 6.3

### Solve Linear Systems by Adding or Subtracting

#### Big Ideas

1. How to solve a system of equations if the coefficients of one variable are opposites ... then you add the equations together.
2. How to solve a system of equations if the coefficients of one variable are the same ... then you subtract the equations.

#### STEPS

- 1) Add the equations together ... find opposites, if needed!
- 2) Solve for either variable.
- 3) Substitute this value into the first equation and then solve again.
- 4) Write your answers as an ordered pair.

#### EXAMPLE 1 Solve.

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

b)  $4x - 3y = 5$   
 $-2x + 3y = -7$

**EXAMPLE 2** Solve.

a)  $4x + 3y = 2$   
 $5x + 3y = -2$

b)  $7x - 2y = 5$   
 $7x - 3y = 4$

**EXAMPLE 3** Solve.

a)  $8x - 4y = -4$   
 $4y = 3x + 14$

b)  $3x + 4y = -6$   
 $2y = 3x + 6$

c)  $2x + 5y = 12$   
 $5y = 4x + 6$

**EXAMPLE 4** During a Kayaking trip, a Kayaker travels 12 miles upstream (against the current) and 12 miles downstream (with the current), as shown. The speed of the current remained constant during the trip. Find the average speed of the Kayak in still water and the speed of the current.



### Steps

1) Find the speed Upstream and Downstream ( $d = rt$ )

2) Write an equation for going Upstream and Downstream.

$$\text{Speed of Still Water} + \text{Speed of Current} = \text{Speed of Kayak}$$

3) Solve the system of equations.