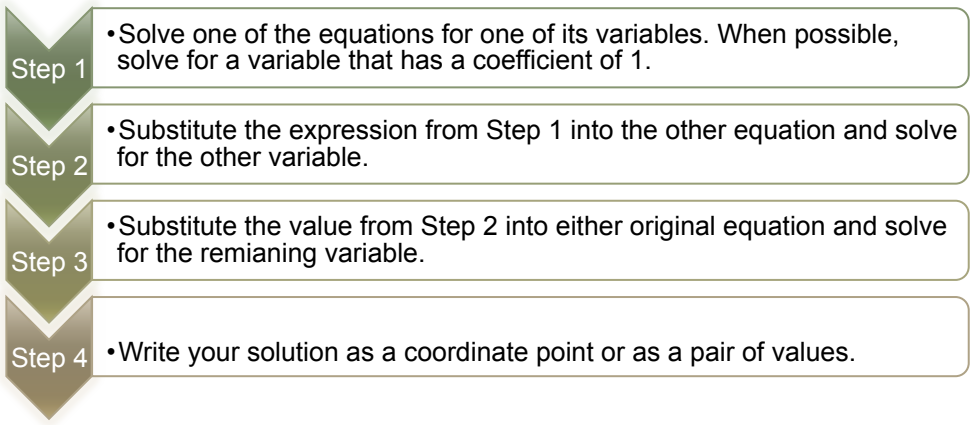
Write your questions here!

We have learned how to solve linear systems by graphing. Now we will learn how to solve the linear systems by using a method called ψψψψψψψψψψ.

Steps for Solving Linear Systems by Substitution



Example 1: Solve the linear system using substitution:

$$4x + 6y = 4$$
$$x = -6 + 2y$$

Step 1: Solve one of the equations for one of its variables.

Step 2: Now, substitute the expression from **Step 1** into the OTHER equation and solve.

Step 3: Next, substitute the value from **Step 2** into either of the original equations and solve for the last unknown variable.

Step 4: Write your solution as a coordinate point or as a pair of values.

Write your questions here!

More Examples:

2. $y = -7 - 3x$
   $-2x + 4y = 0$

3. $x = 2y + 5$
   $x = 10 – 3y$

4. $x – 1 = y$
   $2x – y = 5$

5. $x - y = 3$
   $2x – y = 5$

Now, summarize your notes here!

Practice 8.2 Systems of Equations (Substitution)

Solve each system by substitution.

1) $4x - 4y = -4$
$y = -4x + 1$

2) $y = 2x - 7$
$2x - 4y = 10$

3) $8x + 5y = -24$
$y = 5x + 15$

4) $y = -4x - 5$
$6x - 5y = -1$

5) $y = 4x - 24$
$-3x - 5y = -18$

6) $y = 4x - 17$
$4x + 4y = 12$

7) $x = -1 - 3y$
$2x - 4y = -22$

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

9) $4x + y = -3$
$-7x - 3y = 9$

10) $x = 5y - 11$
$-9x - 7y = -5$

11) Is the point (-1, 3) a solution of the system of linear equations below?

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

12) Is the point (1, 7) a solution of the system of linear equations below?

$2x - 4 = 5$
$x = 1$

Application and Extension

1. Solve the following system of equations using substitution. Write your answers as fractions, if necessary.

$$-x + 2y = -2$$
$$y = 3x + 4$$

2. In the March 1998 issue of ***Great Goatee Magazine***, readers could vote online for their favorite goatee in the *Pitt-Brust Bonanza.* Readers could either vote for Brad Pitt or Mr. Brust. Brust's votes equaled 2 times the sum of Pitt's votes and 400. The total number of votes received was 2012.

a. Model the situation with a linear system.

Pitt?

Let B = # vote for Brust
Let P = # votes for Pitt

Total # of votes: _____ + _____ = 2012

Brust vs Pitt: _____ = 2 (_____ + _____)

Brust?

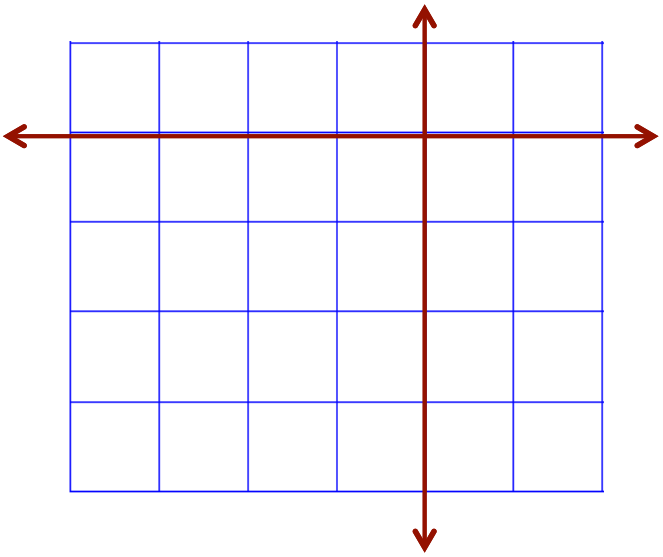
b. Now solve your system using substitution. By how many votes did Brust win the contest?

c. Explain why solving this by graphing wouldn't be ideal.

3. Solve the following systems of equations by graphing AND by substitution!!

$$y - 2x = -1$$
$$y = -3 - 2x$$

Solve by Graphing:



Solution:_____

Solve by Substitution:

Solution:_____

Which method did you find easier? Justify your choice.

Coming Up: Evaluate each expression if a = 4, b = -2, c = 10, x = -3 and y = -5.		
1. a^2a^4	2. a^6	3. a^8
Quick Review: Find the equation of the line that passes through the given points.		
1. (-2, 3); (4, 3)	2. (-5, 3); (-5, 9)	3. (-1, 3); (0, 2)