How Do You Solve a System of Equations by Substitution?

$$3x+2y=10$$
$$2x- y= 9$$

1st   Choose one equation and solve for x or y.

Solve for y in the 2nd equation.

Subtract 2x from both sides $\qquad\qquad$ $-y=-2x+9$

Divide both sides by –1 $\qquad\qquad\qquad$ $y=\mathbf{2x-9}$

2nd   Substitute the expression from that equation into the other equation and solve.

Plug **2x-9** in the 1st equation for y $\qquad$ $3x+2(2x-9)=10$

Simplify $\qquad\qquad\qquad\qquad\qquad\qquad$ $3x+4x-18=10$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $7x - 18 = 10$

Solve $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $7x=28$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $x=4$

3rd Substitute the value found in step 2 back into the equation solved step one.

Use the solved equation $\quad$ $y=2x-9$ $\quad$ and substitute $\;x=4$

Simplify $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ $y=2(4)-9$

Continuing $\qquad\qquad\qquad\qquad\qquad\qquad$ $y=8-9=-1$

So the solution is (4,-1)

Solve by Substitution

Problem:	**Problem:**
1ˢᵗ Choose one equation and solve for x or y.	**1ˢᵗ Choose one equation and solve for x or y.**
2ⁿᵈ Substitute the expression from that equation into the other equation and solve.	**2ⁿᵈ Substitute the expression from that equation into the other equation and solve.**
3ʳᵈ Substitute the value found in step 2 back into the equation solved step one.	**3ʳᵈ Substitute the value found in step 2 back into the equation solved step one.**
Solution: ---------------	Solution: ---------------