7.2 Solve Linear Systems by Substitution

Goal • Solve systems of linear equations by substitution.

Your Notes

SOLVING A LINEAR SYSTEM USING THE SUBSTITUTION METHOD

Step 1 _____ one of the equations for one of its variables. When possible, solve for a variable that has a coefficient of ___ or _____.

Step 2 _____ the expression from Step 1 into the other equation and solve for the other variable.

Step 3 _____ the value from Step 2 into the revised equation from Step 1 and solve.

Example 1 ***Use the substitution method***

Solve the linear system: $x = -2y + 2$ **Equation 1**

$3x + y = 16$ **Equation 2**

1. _____ for x. Equation 1 is already solved for x.

2. Substitute _____ for x in Equation 2 and solve for y.

$3x + y = 16$	**Write Equation 2.**
$3(\_\_\_\_\_) + y = 16$	**Substitute _____ for x.**
$\_\_\_\_\_ + y = 16$	**Distributive property**
$\_\_\_\_\_ = 16$	**Simplify.**
$\_\_\_\_\_ = \_\_\_\_\_$	**Subtract ___ from each side.**
$y = \_\_\_\_\_$	**Divide each side by _____.**

3. Substitute _____ for y in the original Equation 1 to find the value of x.

$x = -2y + 2 = -2(\_\_\_\_\_) + 2 = 4 + 2 = \_\_\_$

The solution is (___, _____).

Remember to check your solution in each of the original equations.

Your Notes

Example 2 ***Use the substitution method***

Solve the linear system: $4x - 2y = 14$ **Equation 1**

$2x + y = -3$ **Equation 2**

Solution

1. Solve Equation 2 for y.

$2x + y = -3$ **Write original Equation 2.**

$y =$ _____ **Revised Equation 2**

2. Substitute _____ for y in Equation 1 and solve for x.

$4x - 2y = 14$ **Write Equation 1.**

$4x - 2($_____$) = 14$ **Substitute** _____ **for y.**

$4x +$ _____ $= 14$ **Distributive property**

_____ $= 14$ **Simplify.**

____ $=$ ___ **Subtract** ___ **from each side.**

$x =$ ___ **Divide each side by** ___.

3. Substitute ___ for x in the revised Equation 2 to find the value of y.

$y =$ _____ $=$ _____ $=$ _____ $=$ _____

The solution is (___, _____).

✔ ***Checkpoint*** **Solve the linear system using the substitution method.**

1. $5x - 4y = -1$ $y = 6x + 5$	**2.** $x + y = 5$ $7x - 9y = 3$

Homework