Solving Systems using Substitution – Part 1

- Solve both equations for y.
- Set them equal to each other.
- Solve the resulting equation for x.
- Solve for y using substitution.

Example:   $y = 3x$
$2x + y = 10$

First, we must solve the second equation for y to get y = -2x + 10.
Now that both equations are solve for y, we need to set them equal to each other.

$3x = -2x + 10$ ⟶ Since y = 3x and y = -2x + 10, then 3x and -2x + 10 must also be equal. We will use this equation to solve for the x-value.

$3x = -2x + 10$ ⟶ Since we have variables on both sides of the equal sing, we must
$+ 2x \quad +2x$ move one variable to the other side by using opposite operations.
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$5x = \quad 10$

$\dfrac{5x}{5} = \dfrac{10}{5}$

$x = 2$   ⟶ Once we know our x- value, we substitute this number into one of the original equations, to find the value of y.

$y = 3x$
$y = 3(2)$
$y = 6$   ⟶ The solution is (2, 6)

Practice.

1.   $y = 6x$
$y = 4x + 18$

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

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3. $x + y = 6$
$y = x$

4. $y = x + 1$
$x + y = 5$

5. $3x - y = 5$
$-x + 2y = 0$

6. $y = -x + 3$
$x - y = -1$