Topic: Solving Systems of equations by the substitution method

Objective: Find solutions to systems of linear equations

① Substitution: when two quantities are equal then you can replace (substitute) either quantity with the other

② Examples

1) $x = 10$ — substitute

$3x + 4$

$3(10) + 4$ — rewrite

2) $y = 3x$ — substitute

$2y + x = 4$

$2(3x) + x = 4$ — rewrite

③ Solving Systems of Equations by Substitution

ex ① $y = 3$

② $y = -2x - 3$

*I like to number my equations

$3 = -2x - 3$

$+3 \quad +3$

$\frac{6}{-2} = \frac{-2x}{-2}$

$-3 = x$

substitute

② $y = -2(x) - 3$

$y = -2(-3) - 3$

$y = 3$

Solution: $(-3, 3)$ — x, y

Steps
1) substitute
2) re-write
3) solve
4) substitute
5) Solution

ex ① $x + 3y = -1$

② $2x - 3y = 7$

*Can only use the substitution method when one (or more) of the variables is by itself

Solve the system using substitution

(ex)

$y = x + 2$

$4x + 4y = -8$ substitute

$4x + 4(x+2) = -8$ rewrite

$4x + 4x + 8 = -8$ solve

$8x + 8 = -8$

$-8 \quad -8$

$\frac{8x}{8} = \frac{-16}{8}$

$x = -2$ substitute

$y = x + 2$ rewrite

$y = (-2) + 2$ solve

$y = 0$

solution : $(-2, 0)$