Solving Linear Systems by Substitution Method

To use the Substitution Method, you can replace one variable with an equivalent expression containing the other variable. This makes a one-variable equation.

1. $y = \boxed{2x+3}$
$y = -2x - 9$

- Substitute 2x+3 for y in the 2nd equation.
- Solve for x.

$(2x+3) = -2x - 9$
$+2x \quad +2x$
$4x + 3 = -9$
$-3 \quad -3$
$4x = -12$
$\frac{4x}{4} = \frac{-12}{4}$
$x = -3$

- Remember that the solution must be a point (x, y).
- Pick one of the original equations.
- Substitute x=-3 into the equation.
- Solve for y.

$y = 2(-3) + 3$
$y = -6 + 3$
$y = -3$

The point of intersection is (-3,-3).

- Write your solution as a point.

2. $\boxed{x} = 2y - 7$
$2\boxed{x} + 4y = 10$

- Substitute 2y-7 for x in the 2nd equation.
- Solve for y.

$2(2y-7) + 4y = 10$
$4y - 14 + 4y = 10$
$8y - 14 = 10$
$+14 \quad +14$
$8y = 24$
$\frac{8y}{8} = \frac{24}{8}$
$y = 3$

- Remember that the solution must be a point (x, y).
- Pick one of the equations.
- Substitute y=3 into the equation.
- Solve for x.

$x = 2(3) - 7$
$= 6 - 7$
$x = -1$

- Write your solution as a point.

The point of intersection is (-1, 3).

→**The solution to a system of equations is the** POINT OF INTERSECTION of the two lines on the graph. This point is the only solution that makes BOTH equations TRUE!!