

Solving linear systems: $ax + by = c$

$$px + qy = r$$

a, b, c, p, q, r: Known numbers

x, y: variables we must solve for (must work in BOTH equations at the same time)

Method:

1. Solve for ONE of the variables in ONE of the equations (doesn't matter which variable and doesn't matter which equation, but pick the easiest one!)
2. Substitute the expression you found in part (1) into the UNUSED equation and solve for the remaining variable.
3. Substitute the value from part (2) into ANY of your equations to solve for the other variable.

Eg: $2x + 3y = 6$
 $x + y = 1$

① EQ2: $x = 1 - y$

② Sub $x = 1 - y$ in EQ 1:

$$\begin{array}{l} 2x + 3y = 6 \\ 2(1 - y) + 3y = 6 \end{array} \quad \begin{array}{l} \rightarrow 2 - 2y + 3y = 6 \\ \rightarrow 2 + y = 6 \end{array} \quad \begin{array}{l} \rightarrow y = 4 \end{array}$$

③ sub $y = 4$ into EQ2: $x + y = 1$ \rightarrow $x = -3$
 $x + 4 = 1$

$$\Rightarrow (x, y) = (-3, 4) \checkmark$$