



## Substitution Method

Steps:

- i) Choose one equation and isolate one variable;  
this equation will be considered the first equation.  
(easiest one to get  $x=$  or  $y=$  from either eqn 1 or eqn 2)
- ii) Substitute the solution from step 1 into the second equation and solve for the variable in the equation.
- iii) Using the value found in step 2, substitute it into the first equation and solve for the second variable.
- iv) Substitute the values for both variables into both equations to show they are correct.

Solve this system of equation by substitution.

$$y = \underline{15+6x}$$

$$-3x - 2y = 0$$

$$-3x - 2y = 0$$

$$-3x - 2(15+6x) = 0$$

$$-3x - 30 - 12x = 0$$

$$-3x - 12x = 0 + 30$$

$$\frac{-15x}{-15} = \frac{30}{-15}$$

$$x = -2$$

$$y = 15 + \underline{6x}$$

$$y = 15 + 6(\underline{-2})$$

$$y = 15 - 12$$

$$y = 3$$

$$(-2, 3)$$

Solve the system by Substitution Method

$$x + 2y = 3$$

$$3x + 5y = 8$$

.....solve for x  $\textcircled{1}$   $x = 3 - 2y$

$$3x + 5y = 8$$

$$3(3-2y) + 5y = 8$$

$$\textcircled{9} - 6y + 5y = 8$$

$$-6y + 5y = 8 - 9$$

$$-y = -1$$

$$\boxed{y = 1}$$

$$x + 2y = 3$$

$$x + 2(1) = 3$$

$$x + 2 = 3$$

$$x = 3 - 2$$

$$\boxed{x = 1}$$

$$(1, 1)$$



Use Substitution to Find the Point of Intersection

$$x - 4y = 6 \quad \xrightarrow{\text{solve for } x} \text{ (i)} \quad x = \underline{6+4y}$$

$$7x + 6y = 8$$

$$\text{(ii)} \quad \underline{7x} + 6y = 8$$

$$7(6+4y) + 6y = 8$$

$$42 + 28y + 6y = 8$$

$$34y = 8 - 42$$

$$\frac{34y}{34} = \frac{-34}{34}$$

$$\boxed{y = -1}$$

$$\text{(iii)} \quad x - 4y = 6$$

$$x - 4(-1) = 6$$

$$x + 4 = 6$$

$$x = 6 - 4$$

$$\boxed{x = 2}$$

$$\text{(iv)} \quad (2, -1)$$

Use Substitution to Find the Point of Intersection

$$\begin{aligned} 2x + y &= 9 \\ 3x - 5y &= -19 \end{aligned}$$

Solve for y

$$\rightarrow (i) \quad y = -2x + 9$$

$$(ii) \quad 3x - 5y = -19$$

$$3x - 5(-2x + 9) = -19$$

$$3x + 10x - 45 = -19$$

$$13x = -19 + 45$$

$$\frac{13x}{13} = \frac{26}{13}$$

$$x = 2$$

$$(iii) \quad 2x + y = 9$$

$$2(2) + y = 9$$

$$4 + y = 9$$

$$y = 9 - 4$$

$$y = 5$$

$$(iv) \quad (2, 5)$$