

olve each system by graphing.

1) $y = -x - 3$ $m = -1$ $y\text{-int} = -3$
 $y = -2x + 3$ $m = -2$ $y\text{-int} = 3$

Solution
 $(1, -4)$

Handwritten note: $m_1 = -1$, $m_2 = -2$

2) $y = -x + 2$ $m = -1$ $y\text{-int} = 2$
 $y = -x - 4$ $m = -1$ $y\text{-int} = -4$

- Parallel lines Never Intersect.
 - No Solution

3) $y = \frac{2}{3}x + 4$ $m = \frac{2}{3}$ $y\text{-int} = 4$
 $y = -\frac{4}{3}x - 2$ $m = -\frac{4}{3}$ $y\text{-int} = -2$

Solution
 $(-4, 2)$

4) $y = -x - 4$ $m = -1$ $y\text{-int} = -4$
 $y = 6x + 3$ $m = 6$ $y\text{-int} = 3$

Solution
 $(-1, -3)$

$y = mx + b$

↑
Slope

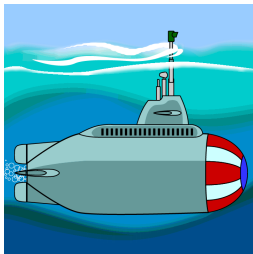
↑
Intercept.

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.

Substitution



You need to isolate x or y

$$1 \quad y = 3 + 3x$$

$$2 \quad +3x - 8y = -3$$

$$0 = 3 + 3(-1)$$

$$0 = 3 - 3$$

$$0 = 0$$

$$3 \quad 3x - 8y = -3 \quad 4 \quad y = 3 + 3(-1)$$

$$3x - 8(3 + 3x) = -3 \quad y = 3 - 3$$

$$y = 0$$

Solution

$$(-1, 0)$$

$$3x - 24 - 24x = -3$$

$$3x - 24x = -3 + 24$$

$$\frac{-21x}{-21} = \frac{21}{-21}$$

$$x = -1$$

Solve this system of equation by substitution.

$$1 \quad y = 15 + 6x$$

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

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

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

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

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

$$x = -2$$

$$\begin{aligned} 3 &= 15 + 6(-2) \\ 3 &= 15 + (-12) \\ 3 &= 3 \end{aligned}$$

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

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

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

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

$$-15x = 30$$

$$x = -2$$

$$y = 15 + 6x$$

$$y = 15 + 6(-2)$$

$$y = 15 - 12$$

$$y = 3$$

$$\begin{matrix} x & y \\ (-2, 3) \end{matrix}$$

Substitution

$$\begin{aligned} \Rightarrow y &= 2x + 2 \\ y &= 6x + 14 \end{aligned}$$

$$6x + 14 = 2x + 2$$

$$6x - 2x = 2 - 14$$

$$\frac{4x}{4} = \frac{-12}{4}$$

$$x = -3$$

$$\begin{aligned} y &= 2(-3) + 2 \\ y &= -6 + 2 \\ y &= -4 \end{aligned}$$

$$(-3, -4)$$

What if??

$$4x - y = -1$$

$$-4x + 3y = 11$$

$$-y = \frac{-4x - 1}{-1}$$

$$y = 4x + 1$$

$$-4x + 3(4x + 1) = 11$$

$$-4x + 12x + 3 = 11$$

$$-4x + 12x = 11 - 3$$

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

$$x = 1$$

$$4(1) - y = -1$$

$$-y = -1 - 4$$

$$\frac{-y}{-1} = \frac{-5}{-1}$$

$$y = 5$$

$$(1, 5)$$

Solve the system by Substitution Method

$$x + 2y = 3$$

$$3x + 5y = 8$$

.....solve for x → $x = 3 - 2y$

$$3x + 5y = 8$$

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

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

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

$$-y = -1$$



$$x + 2y = 3$$

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

$$x + 2 = 3$$

$$x = 3 - 2$$

$$x = 1$$

$$(1,1)$$

Use Substitution to Find the Point of Intersection

$$1) \quad \begin{aligned} x - 4y &= 6 \\ 7x + 6y &= 8 \end{aligned}$$



