

Method 2: Solve by Substitution:

Steps:

1. **Isolate** a variable (choose the easiest one!), let's call this the 1st equation
2. **Replace** the solution to Step 1 into the 2nd equation and **solve** the equation
3. Use the value from Step 2 and substitute it into the 1st equation to solve for the other variable
4. **State the POI** (Point of Intersection) by stating "The POI is (,)"

Examples

$$x = -6y - 11$$

$$x = y + 3$$

$$2x + y = -15$$

$$3x - y = -15$$

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$$2x + y = -15$$

$$3x - y = -15$$

$$\frac{1}{2} \begin{cases} x = -6y - 11 \\ x = y + 3 \end{cases}$$

Step ① isolate x ✓

Step ② sub 1. into x value of 2

$$-6y - 11 = y + 3 + 6y$$

$$-11 = 7y + 3$$

$$-14 = 7y$$

$$-2 = y$$

Step ③ sub y into either equation and find x

Step ④ state POI

$$x = y + 3$$

$$x = -2 + 3 \quad x = 1$$

∴ POI is (1, -2)

$$x = -6y - 11$$
$$x = y + 3$$

Step ① isolate variable y in

$$2x + y = -15$$
$$y = -15 - 2x$$

Step ② sub 1 into y value of 2

$$3x - (-15 - 2x) = -15$$
$$3x + 15 + 2x = -15$$
$$5x + 15 = -15$$
$$5x = -30$$
$$x = -6$$

Step ③ solve y

$$2x + y = -15$$

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

$$\cancel{+12} -12 + y = -15 + 12$$

$$y = -3$$

Step ④ state POI

∴ POI is $(-6, -3)$

Course: Grade 10 Mathematics

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

Step ①

$$y - 3x = 5 + 3x$$

$$y = 5 + 3x$$

Step ②

$$5 + 3x + x = 3$$

$$5 + 4x = 3 - 5$$

$$4x = -2$$

$$x = -\frac{1}{2}$$

$$\begin{aligned} 4x + y &= 11 \\ x + 2y &= 8 \end{aligned}$$

Step ③

$$\begin{aligned} y + x &= 3 \\ + \frac{1}{2}y - \frac{1}{2}x &= 3 + \frac{1}{2} \end{aligned}$$

$$y = \frac{3}{2} + \frac{1}{2}$$

$$y = \frac{4}{2} + \frac{1}{2}$$

$$y = \frac{5}{2}$$

④ state POI
 $\therefore$ POI is $(-\frac{1}{2}, \frac{5}{2})$