

# Linear Systems: Solving by Substitution Continued...

Date \_\_\_\_\_

**PRACTICE QUESTIONS:** Solve the following systems using SUBSTITUTION ...

a)  $x - y = 8$  ①  $\Rightarrow x = 8 + y$  ③  
 $x + 2y = 14$  ②

Sub ③ into ②

$$(8 + y) + 2y = 14$$

$$8 + 3y = 14$$

$$3y = 14 - 8$$

$$\frac{3y}{3} = \frac{6}{3}$$

$$\boxed{y = 2}$$

Sub  $y = 2$  into ③

$$x = 8 + 2$$

$$\boxed{x = 10}$$

P.O.I is (10, 2).

b)  $3x + 5y = 2$  ①  
 $x = 10 + 3y$  ②

Sub ② in ①

$$3(10 + 3y) + 5y = 2$$

$$30 + 9y + 5y = 2$$

$$14y = 2 - 30$$

$$\frac{14y}{14} = \frac{-28}{14}$$

$$\boxed{y = -2}$$

Sub.  $y = -2$  into ②

$$x = 10 + 3(-2)$$

$$x = 10 - 6$$

$$\boxed{x = 4}$$

$\therefore$  POI is (4, -2)

c)  $4x + y = -13$  ①  $\Rightarrow y = -4x - 13$  ③  
 $3x - 4y = 14$  ②

Sub ③ into ②

$$3x - 4(-4x - 13) = 14$$

$$3x + 16x + 52 = 14$$

$$19x = 14 - 52$$

$$\frac{19x}{19} = \frac{-38}{19}$$

$$\boxed{x = -2}$$

Sub  $x = -2$  into ③

$$y = -4(-2) - 13$$

$$y = 8 - 13$$

$$\boxed{y = -5}$$

$\therefore$  POI is (-2, -5)

d)  $y = 4x - 15$  ①  
 $x + 2y = 6$  ②

Sub ① into ②

$$x + 2(4x - 15) = 6$$

$$x + 8x - 30 = 6$$

$$9x = 6 + 30$$

$$\frac{9x}{9} = \frac{36}{9}$$

$$\boxed{x = 4}$$

Sub  $x = 4$  into ①

$$y = 4(4) - 15$$

$$y = 16 - 15$$

$$\boxed{y = 1}$$

$\therefore$  POI is (4, 1)