

6.3 Part 2

Tuesday, May 16, 2023

11:13 AM

6.3 Solving a Linear System by Elimination – Part 2

Example 1 : Solve by elimination and check the answer. (Write the solution as an ordered pair)

$$\begin{aligned} \textcircled{1} \quad & \frac{x}{3} + \frac{y}{4} = 1 \\ \textcircled{2} \quad & \frac{x}{2} - \frac{y}{8} = \frac{1}{2} \end{aligned}$$

Equation ① LCM = 12

Equation ② LCM = 8

$$\textcircled{1} \quad 12 \left(\frac{x}{3} \right) + 12 \left(\frac{y}{4} \right) = 12(1)$$

$$\rightarrow \textcircled{1} \quad 4x + 3y = 12$$

$$\textcircled{2} \quad 8 \left(\frac{x}{2} \right) - 8 \left(\frac{y}{8} \right) = 8 \left(\frac{1}{2} \right)$$

$$\textcircled{2} \quad 4x - y = 4$$

$$\textcircled{1} \quad 4x + 3y = 12$$

$$\textcircled{2} \quad (-1)(4x) - (-1)y = (-1)(4)$$

$$\textcircled{2} \quad -4x + y = -4$$

$$\textcircled{1} \quad 4x + 3y = 12$$

$$\hline 0x + 4y = 8$$

$$\frac{4y}{4} = \frac{8}{4}$$

$$y = 2$$

$$4x + 3y = 12$$

$$y = 2$$

$$4x + 3(2) = 12$$

$$4x + 6 = 12$$

$$4x = 6$$

$$x = \frac{6}{4} = \frac{3}{2}$$

$$\boxed{\left(\frac{3}{2}, 2 \right)}$$

Verify

$$\textcircled{1} \quad 4 \left(\frac{3}{2} \right) + 3(2) = 12$$

$$6 + 6 = 12$$

$$12 = 12 \quad \checkmark$$

$$\textcircled{2} \quad 4 \left(\frac{3}{2} \right) - 2 = 4$$

$$6 - 2 = 4$$

$$4 = 4 \quad \checkmark$$

b) During a clothing sale, two sweaters and four coats cost a total of \$392. Three sweaters and a coat cost \$163. How much does each garment cost? Here is a linear system that represents this situation:

$$2s + 4c = 392$$

$$3s + c = 163$$

s = cost of sweater c = cost of coat

$$\begin{aligned} \textcircled{1} \quad & 2s + 4c = 392 \\ \textcircled{2} \quad & 3s + c = 163 \end{aligned}$$

Solve elimination

$$\textcircled{2} \quad (-4)3s + (-4)c = (-4)(163)$$

$$\textcircled{2} \quad -12s - 4c = -652$$

$$\textcircled{1} \quad 2s + 4c = 392$$

$$-10s + 0c = -260$$

$$\frac{-10s}{-10} = \frac{-260}{-10}$$

$$s = 26$$

Sweater costs \$26
Coat costs \$85

$$\begin{aligned} 2(26) + 4c &= 392 \\ 52 + 4c &= 392 \\ -52 & \quad \quad 52 \end{aligned}$$

$$\frac{4c}{4} = \frac{340}{4}$$

$$c = 85$$

Practice: p.437 #6ab, 7cd, 12ab; p.441 #4b

Mrs. Shaw

F & PC 10