

OCT 24/07

### 3 VARIABLE SYSTEMS OF EQUATIONS

$$\textcircled{1} \quad 2x + 2y + z = 3$$

$$\textcircled{2} \quad 2x - 2y + 3z = 1$$

$$\textcircled{3} \quad 3x + 4y + 2z = 4$$

ELIMINATE "y"

$$\begin{array}{r} \textcircled{1} \quad 2x + 2y + z = 3 \\ + \textcircled{2} \quad 2x - 2y + 3z = 1 \\ \hline 4x + 4z = 4 \end{array} \quad \begin{array}{r} \textcircled{1} \times 2 \quad 4x - 4y + 6z = 2 \\ + \textcircled{3} \quad 3x + 4y + 2z = 4 \\ \hline 7x + 8z = 6 \end{array}$$

SOLVE FOR "x"

$$\begin{array}{r} 4x + 4z = 4 \quad \times -2 \quad -8x - 8z = -8 \\ 7x + 8z = 6 \quad + \quad 7x + 8z = 6 \\ \hline -x = -2 \end{array}$$

TO FIND "z"

$$4(2) + 4z = 4$$

$$8 + 4z = 4$$

$$4z = -4$$

$$\textcircled{z = -1}$$

$$\text{SOLN } (2, 0, -1)$$

$$-x = -2$$

$$\textcircled{x = 2}$$

SOLVING FOR "y"

$$2x + 2y + z = 3$$

$$2(2) + 2y - 1 = 3$$

$$4 + 2y - 1 = 3$$

$$2y = 0$$

$$\textcircled{y = 0}$$

$$\begin{aligned} \textcircled{1} \quad & 3x - 4y + 5z = 2 \\ \textcircled{2} \quad & 4x + 5y - 3z = -5 \\ \textcircled{3} \quad & 5x - 3y + 2z = -11 \end{aligned}$$

ELIMINATE "z"

$$\begin{aligned} \textcircled{1} \times 3 \quad & 9x - 12y + 15z = 6 \\ \textcircled{2} \times 5 \quad & 20x + 25y - 15z = 25 \\ + & \\ \hline & 29x + 13y = -19 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \times 2 \quad & 8x + 10y - 6z = -10 \\ \textcircled{3} \times 3 \quad & 15x - 9y + 6z = -33 \\ + & \\ \hline & 23x + y = -43 \end{aligned}$$

SOLVE FOR "x" ELIMINATE "y"

$$\begin{aligned} 29x + 13y &= -19 & 29x + 13y &= -19 \\ 23x + y &= -43 & \rightarrow x-13 & -299x - 13y = 559 \\ + & & + & \\ \hline & & -270x &= 540 \end{aligned}$$

SOLVE FOR "y"

$$\begin{aligned} 23(-2) + y &= -43 \\ -46 + y &= -43 \\ y &= 3 \end{aligned}$$

$$x = -2$$

SOLVE FOR "z"

$$\begin{aligned} 3x - 4y + 5z &= 2 \\ 3(-2) - 4(3) + 5z &= 2 \\ -6 - 12 + 5z &= 2 \\ 5z &= 20 \\ z &= 4 \end{aligned}$$

SOLN

$$(-2, 3, 4)$$

Ex #25 Q# 1-5, 7-14