

Solve:

$$(3) 5x - \left(\frac{5y-2}{3} \right) + 11 = 0 \quad (-3, -2)$$

$$(2) \frac{x+3}{2} + 4y = -8 \quad (2)$$

$$15x - 5y + 2 + 33 = 0 \Rightarrow \begin{cases} 15x - 5y = -35 \quad (\div 5) \\ x + 8y = -19 \quad (\times 3) \end{cases}$$

$$\begin{cases} x + 8y = -19 \quad (\times 3) \\ 3x - y = -7 \end{cases}$$

$$\begin{array}{r} 3x + 24y = -57 \\ \underline{3x - y = -7} \\ -25y = -50 \end{array}$$

$$\frac{-25y}{-25} = \frac{50}{-25}$$

$$y = -2$$

$$x + 8(-2) = -19$$

$$x - 16 = -19$$

$$x = -19 + 16$$

$$x = -3$$

$$(-3, -2)$$

Another Example???

The distance from Cambridge to Ottawa is 480 km. Gerry is able to drive at 100 km/h on Highway 401 but can only average 60 km/h on Highway 7. If the trip takes 6 hours, how far did he travel on Highway 401?

	d	s	t
Hwy 401	x	100	$\frac{x}{100}$
Hwy 7	y	60	$\frac{y}{60}$



$$\begin{cases} x + y = 480 \\ \left(\frac{x}{100} + \frac{y}{60} = 6 \right) \cdot 300 \end{cases}$$

$$3x + 5y = 1800$$

$$3x + 3y = 1440$$

$$\frac{2y}{2} = \frac{360}{2}$$

$$y = 180$$

$$x = 480 - 180$$

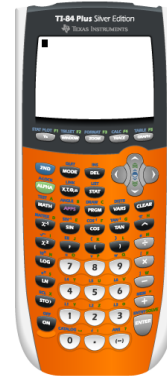
$$x = 300$$

300 km on Hwy 401

Solving a 3 by 3 System of Equations

$$\begin{aligned} \textcircled{1} \quad & x - y + z = 0 \\ 3x - \textcircled{2}y + 5z &= 8 \\ 2x + \textcircled{3}y - 3z &= -9 \end{aligned}$$

Check with TI-83???



STEPS:

- 1) Eliminate one of the variables
- 2) Solve the 2 x 2 system
- 3) Use "backward substitution" to obtain a solution

$$\begin{aligned} \textcircled{1} + \textcircled{3} \quad & 3x - 2z = -9 & \begin{array}{l} 2x - 2y + 2z = 0 \\ 3x - 2y + 5z = 8 \\ \hline x + 3z = 8 \end{array} \end{aligned}$$

$$\begin{aligned} & 3x - 2z = -9 \\ & (x + 3z = 8) \times 3 \end{aligned}$$

$$\begin{aligned} & 3x + 9z = 24 \\ & 3x - 2z = -9 \\ \hline & \end{aligned}$$

$$\frac{11z = 33}{11} \quad \frac{33}{11}$$

$$\underline{z = 3}$$

$$\begin{aligned} x + 3(3) &= 8 \\ x + 9 &= 8 \\ \underline{x} &= -1 \end{aligned}$$

$$\begin{aligned} x - y + z &= 0 \\ -1 - y + 3 &= 0 \\ -1 + 3 &= y \\ \underline{2} &= y \end{aligned}$$

Another Example???

Check with TI-83???

$$\begin{aligned}4x + 9 &= 3y - 6z \\ 3z &= 10 + 2x + 4y \\ 2y &= 4z - 11 - 3x\end{aligned}$$

$$(-3, -1, 0)$$



$$\begin{aligned}1) & 4x - 3y + 6z = -9 \\ 2) & 2x + 4y - 3z = -10 \\ 3) & 3x + 2y - 4z = -11\end{aligned}$$

$$\begin{array}{r}4x - 3y + 6z = -9 \\ 4x + 8y - 6z = -20 \\ \hline 8x + 5y = -29\end{array}$$

$$\begin{array}{r}8x + 16y - 12z = -40 \\ 9x + 6y - 12z = -33 \\ \hline -x + 10y = -7\end{array}$$

$$\begin{array}{r}(8x + 5y = -29) \times 2 \\ -x + 10y = -7 \\ \hline 16x + 10y = -58 \\ \hline -17x = 51 \\ \hline -17 \quad -17 \\ \hline x = -3\end{array}$$

$$\begin{aligned}-(-3) + 10y &= -7 \\ 10y &= -10 \\ y &= -1\end{aligned}$$

$$\begin{aligned}3x + 2y - 4z &= -11 \\ 3(-3) + 2(-1) - 4z &= -11 \\ -9 - 2 - 4z &= -11 \\ -4z &= -11 + 11 \\ -4z &= 0 \\ z &= 0\end{aligned}$$

EXTRA PRACTICE...

Review - Systems of Equations.doc

Attachments

Review - Systems of Equations.doc