Warm-up

January 26, 2017

Solve for z.

$5x - 6z = 10$

$4x + y + 2z = -3$

$-x + 2y = 8$

$$\begin{vmatrix} 5 & 0 & -6 \\ 4 & 1 & 2 \\ -1 & 2 & 0 \end{vmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 10 \\ -3 \\ 8 \end{bmatrix}$$

$$D = \begin{vmatrix} 5 & 0 & -6 & 5 & 0 \\ 4 & 1 & 2 & 4 & 1 \\ -1 & 2 & 0 & -1 & 2 \end{vmatrix}$$

$(0+0+-48)-(6+20+0)$ $-48-26=$ $\underline{-74}$

$$Dz = \begin{vmatrix} 5 & 0 & 10 & 5 & 0 \\ 4 & 1 & -3 & 4 & 1 \\ -1 & 2 & 8 & -1 & 2 \end{vmatrix}$$

$$(40 + 0 + 80) - (-10 + -30 + 0)$$

$$120 + +40$$

$$160$$

$$160 \mid -74$$

$$z = \frac{-80}{37}$$

$$\begin{bmatrix} 5 & 0 & -6 \\ 4 & 1 & 2 \\ -1 & 2 & 0 \end{bmatrix} \begin{matrix} 5 & 0 \\ 4 & 1 \\ -1 & 2 \end{matrix} = \begin{bmatrix} 10 \\ -3 \\ 8 \end{bmatrix}$$

$D = 5(1)(0) + 0(2)(-1) + -6(4)(2)$
$- -1(1)(-6) + 2(2)(5) + 0(4)(0) = -74$

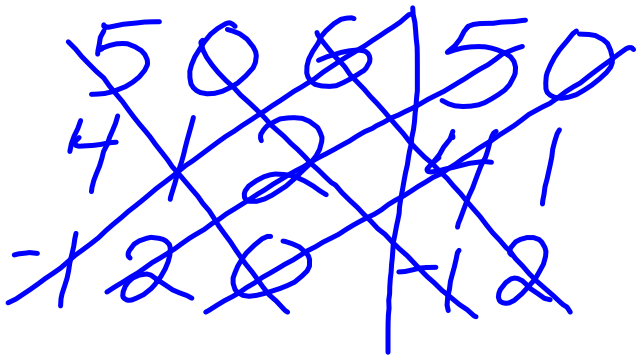
$$\begin{bmatrix} 5 & 0 & 10 \\ 4 & 1 & -3 \\ -1 & 2 & 8 \end{bmatrix} \begin{matrix} 5 & 0 \\ 4 & 1 \\ -1 & 2 \end{matrix}$$

$Dz = 5(1)(8) + 0(-3)(-1) + 10(4)(2) - 120 - 40$
$-1(1)(10) + 2(-3)(5) + 8(4)(0) \quad 160$

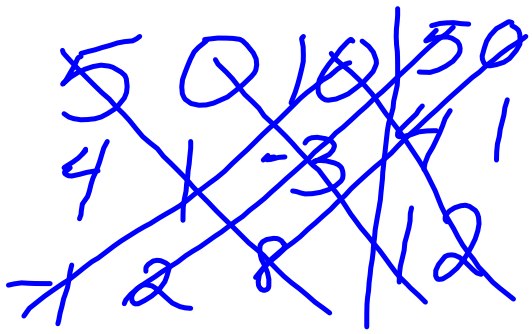
$$\frac{Dz}{D} \quad \frac{160}{-74} = -2.16$$

$$z = \frac{80}{-37}$$

$5x - 6z = 10$
$4x + y = -3$
$-x + 2y = 8$



$100 \quad 481$
$1620 \quad 81$
-48
20
-74



$40\ 0\ 80$
$-10\ 0\ -30$
120
-40
160

$\frac{160}{-74} = \frac{80}{-37} = z$


Let's
Celebrate
like meow.

Solve.

$$\begin{bmatrix} 8 & -3 \\ 2 & 7 \end{bmatrix} X - \begin{bmatrix} 5 \\ 7 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$+\begin{bmatrix} 5 \\ 7 \end{bmatrix} + \begin{bmatrix} 5 \\ 7 \end{bmatrix}$$

$$\begin{bmatrix} 8 & -3 \\ 2 & 7 \end{bmatrix} X = \begin{bmatrix} 5 \\ 8 \end{bmatrix}$$

$D = 56 - -6 = 62$

$D_x = \begin{vmatrix} 5 & -3 \\ 8 & 7 \end{vmatrix} = 35 - -24 = 59$

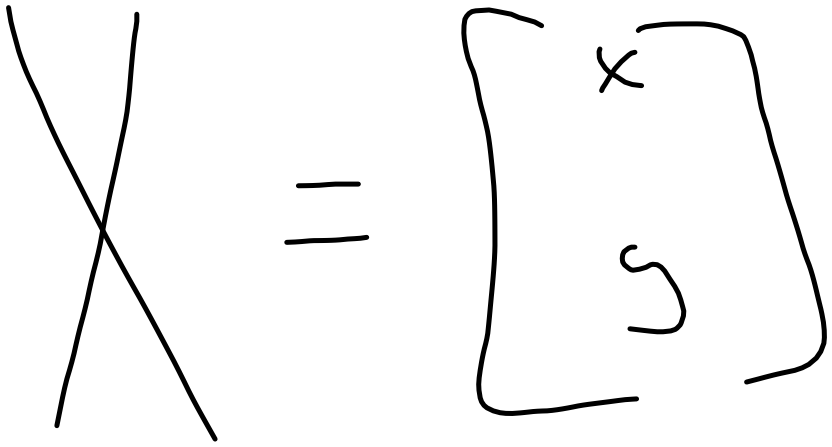
$D_y = \begin{vmatrix} 8 & 5 \\ 2 & 8 \end{vmatrix} = 64 - 10 = 54$

$X = \frac{D_x}{D} = \frac{59}{62}$

$Y = \frac{D_y}{D} = \frac{54}{62}$

$$\begin{bmatrix} \frac{59}{62} \\ \frac{54}{62} \end{bmatrix}$$

$$\begin{bmatrix} 8 & -3 \\ 2 & 7 \end{bmatrix} X - \begin{bmatrix} 5 \\ 7 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$



$$= \begin{bmatrix} x \\ 5 \end{bmatrix}$$

$$= \begin{bmatrix} \frac{49}{6} \\ -\frac{10}{6} \end{bmatrix}$$