Systems:

Non-Calc [coeff matrix] · [variable matrix] = [constant matrix]

① $x + 2y = 4$ ✓
$3x + 2y = 0$ ✓ (-2, 3)

$\begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 0 \end{bmatrix}$ (A, B)

$A^{-1} * B$

det: $2 - 6 = -4$

$-\frac{1}{4}\begin{bmatrix} 2 & -2 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} -\frac{1}{2} & \frac{1}{2} \\ \frac{3}{4} & -\frac{1}{4} \end{bmatrix} \begin{bmatrix} 4 \\ 0 \end{bmatrix}$

$x = -2 + 0 = -2$

$y = 3 + 0 = 3$ (-2, 3)

Jan 17-9:43 AM

② $6x + 2y = 0$ ✓
$-x + 5y = 16$ ✓ (-1, 3)

$\begin{bmatrix} 6 & 2 \\ -1 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 16 \end{bmatrix}$

det: $30 - -2 = 32$

$\frac{1}{32}\begin{bmatrix} 5 & -2 \\ 1 & 6 \end{bmatrix} = \begin{bmatrix} \frac{5}{32} & -\frac{2}{32} \\ \frac{1}{32} & \frac{6}{32} \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 16 \end{bmatrix}$ (A^{-1})

$x = 0 + -1 = -1$ (-1, 3)

$y = 0 + \frac{96}{32} = 0 + 3 = 3$

Jan 17-12:15 PM

③ $-2x - 3y = -6$
$4x + 2y = 20$

Calc

$3x - 2y + z = 0$
$2x + 3y = 12$
$y + 4z = -18$

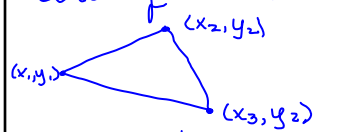
$\begin{bmatrix} 3 & -2 & 1 \\ 2 & 3 & 0 \\ 0 & 1 & 4 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 12 \\ -18 \end{bmatrix}$ (A, B)

$A^{-1} * B$

(3, 2, -5)

Jan 17-12:20 PM

Area of a △:



$\text{Area} = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

$\text{Area} = .5\begin{vmatrix} x & y & 1's \\ 3 & -5 & 1 \\ 2 & 6 & 1 \\ 4 & 0 & 1 \end{vmatrix}$

$\frac{1}{2} \cdot 8$

$= 8\ u^2$

Jan 17-1:07 PM

② $-2x - 3y = -6$ ✓ (6, -2)
$4x + 2y = 20$ ✓

$\begin{bmatrix} -2 & -3 \\ 4 & 2 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -6 \\ 20 \end{bmatrix}$ (A, B)

det: $-4 + 12 = 8$

$A^{-1} * B$

$\frac{1}{8}\begin{bmatrix} 2 & 3 \\ -4 & -2 \end{bmatrix} = \begin{bmatrix} \frac{2}{8} & \frac{3}{8} \\ -\frac{4}{8} & -\frac{2}{8} \end{bmatrix} \cdot \begin{bmatrix} -6 \\ 20 \end{bmatrix}$

$x = \frac{2}{8}(-6) + \frac{3}{8}(20)$

$= \frac{-12}{8} + \frac{60}{8} = \frac{48}{8} = 6$ (6, -2)

$y = \frac{-4}{8}(-6) + \frac{-2}{8}(20)$

$= \frac{24}{8} - \frac{40}{8} = \frac{-16}{8} = -2$

Jan 17-2:19 PM

③ $5x - 7y = -15$
$3x + y = 17$

calc

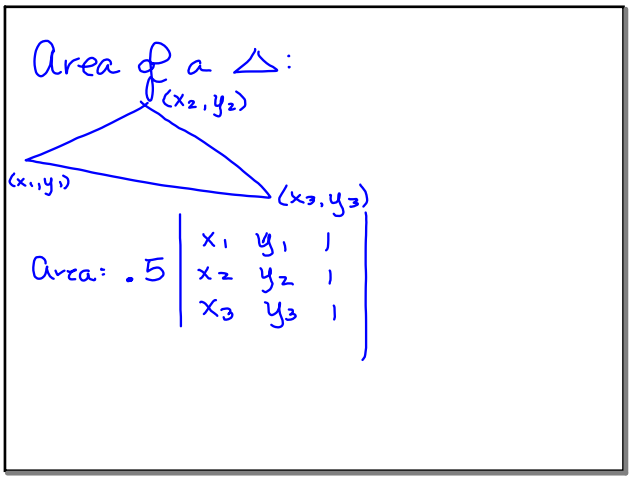
$x - 3y + 4z = 3$
$2x - 5y = 19$
$-2x + 4y - 5z = -6$

$\begin{bmatrix} 1 & -3 & 4 \\ 2 & -5 & 0 \\ -2 & 4 & -5 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 19 \\ -6 \end{bmatrix}$ (A, B)

$A^{-1} * B$

(2, -3, -2)

Jan 17-2:24 PM



Jan 17-2:38 PM