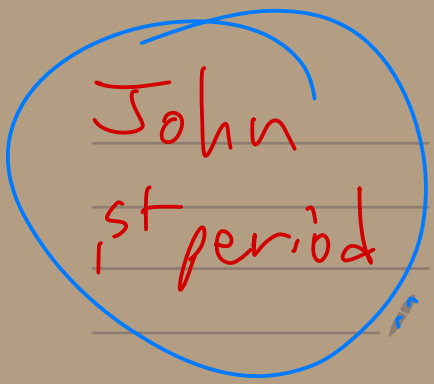
My Test Notebook



n linear equations in n unknowns

$$2x_0 - x_1 = 0$$
$$-x_0 + 2x_1 = 3$$

ROW PICTURE
⊛ COLUMN PICTURE
MATRIX PICTURE

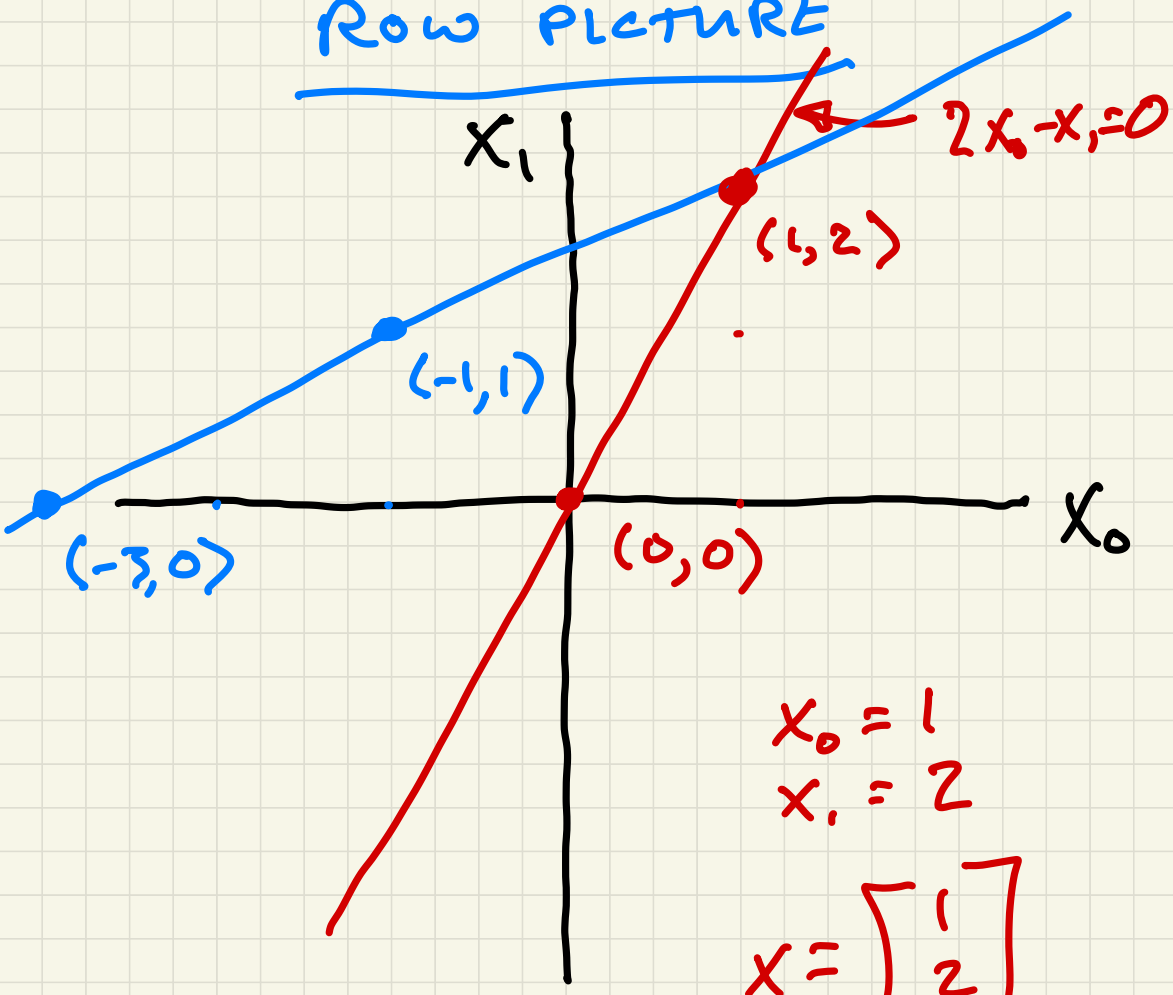
MATRIX PICTURE

$$\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix} \begin{bmatrix} x_0 \\ x_1 \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix}$$

$$A \quad x = b$$

$$2x_0 - x_1 = 0$$
$$-x_0 + 2x_1 = 3$$

ROW PICTURE



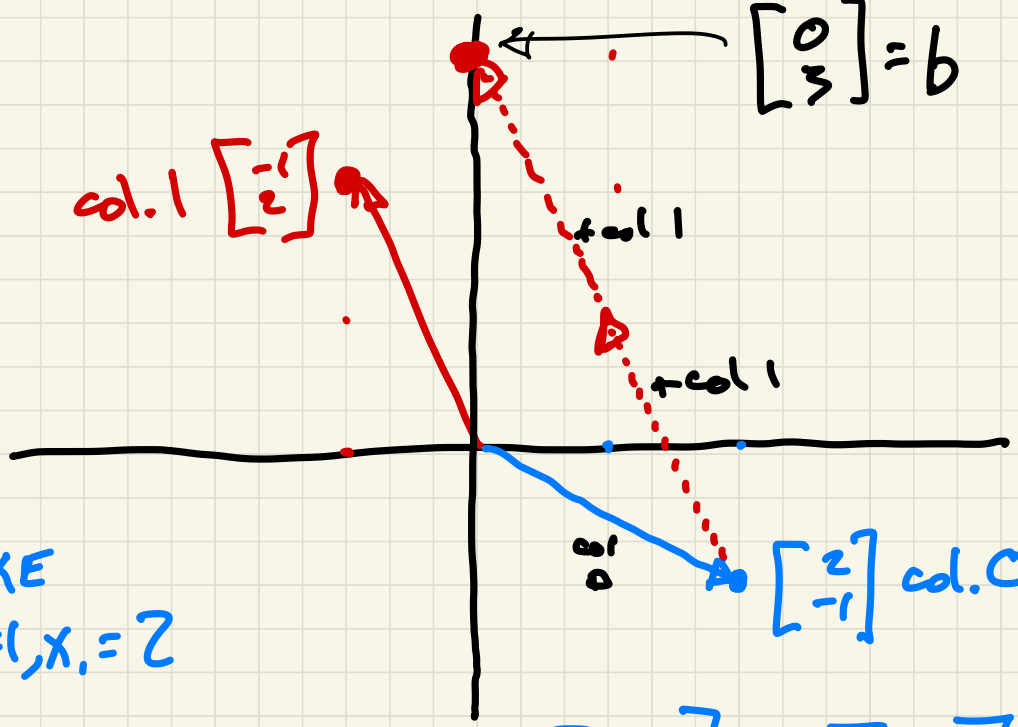
$x_0 = 1$
$x_1 = 2$

$$x = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$

COLUMN PICTURE

$$x_0 \begin{bmatrix} 2 \\ -1 \end{bmatrix} + x_1 \begin{bmatrix} -1 \\ 2 \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix}$$

B AS A LINEAR COMBINATION OF THE COLUMNS OF A



TAKE
$x_0 = 1, x_1 = 2$

$$1 \begin{bmatrix} 2 \\ -1 \end{bmatrix} + 2 \begin{bmatrix} -1 \\ 2 \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix}$$

3 EQUATIONS IN 3 UNKNOWNS

ROW PICTURE: 3 planes intersect in a point

COL PICTURE: column = point in 3-space

4 eqns, etc. I find it easier to visualize points in 4-space or in n-space

I find cols easier to visualize than rows.

NOWADAYS $n = 1{,}000{,}000{,}000$ is not unusual!

[END of lecturette]