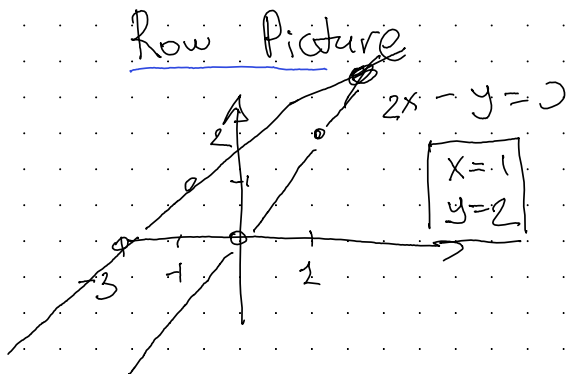$$2x - y = 0$$
$$-x + 2y = 3$$

$$\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix} \qquad \text{matrix form}$$
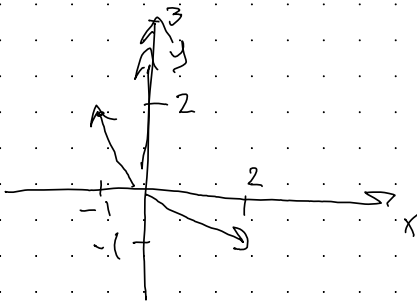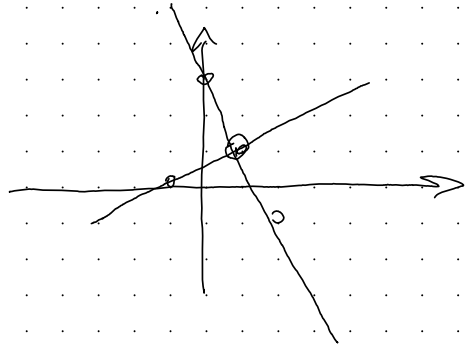
$$A \qquad x = b$$

Row Picture

$$2x - y = 0$$

$$\boxed{\begin{array}{l} x = 1 \\ y = 2 \end{array}}$$

Column Picture

$$x \begin{bmatrix} 2 \\ -1 \end{bmatrix} + y \begin{bmatrix} -1 \\ 2 \end{bmatrix} = \begin{bmatrix} 0 \\ 3 \end{bmatrix} \qquad \text{linear combination of columns}$$

$$\begin{cases} 2x + y = 3 \\ x - 2y = -1 \end{cases}$$

row picture

column picture

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