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I

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

Since

$$D := \begin{vmatrix} 2 & 3 \\ 1 & -1 \end{vmatrix} = -5 \neq 0,$$

we can Cramer's rule.

$$x = \frac{1}{-5} \begin{vmatrix} 1 & 3 \\ 2 & -1 \end{vmatrix} = -\frac{1}{5}(1 \cdot (-1) - 2 \cdot 3)$$

$$= \frac{7}{5}$$

$$y = \frac{1}{-5} \begin{vmatrix} 2 & 1 \\ 1 & 2 \end{vmatrix} = -\frac{1}{5}(2 \cdot 2 - 1 \cdot 1) = -\frac{3}{5}$$

II

$$\begin{pmatrix} a_1 & b_1 \\ a_2 & b_2 \end{pmatrix} \begin{pmatrix} 1 & \lambda \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} a_1 & \lambda a_1 + b_1 \\ a_2 & \lambda a_2 + b_2 \end{pmatrix}$$

$$\begin{pmatrix} 1 & \lambda \\ 0 & 1 \end{pmatrix} \begin{pmatrix} a_1 & b_1 \\ a_2 & b_2 \end{pmatrix} = \begin{pmatrix} a_1 + \lambda a_2 & b_1 + \lambda b_2 \\ a_2 & b_2 \end{pmatrix}$$