Matrices: Cramer's Rule

$$ax+by=c$$
$$dx+ey=f$$

$$x=\frac{\begin{vmatrix} c & b \\ f & e \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}} \qquad y=\frac{\begin{vmatrix} a & c \\ d & f \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}}$$

x y ans

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$$dx+ey=f$$

$$x=\frac{\begin{vmatrix} c & b \\ f & e \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}} \qquad y=\frac{\begin{vmatrix} a & c \\ d & f \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}}$$

Solve:

$$2x-3y=3$$
$$x+4x=7$$

$$x=\frac{\begin{vmatrix} 3 & -3 \\ 7 & 4 \end{vmatrix}}{\begin{vmatrix} 2 & -3 \\ 1 & 4 \end{vmatrix}}=\frac{12-(-21)}{8-(-3)}=\frac{12+21}{8+3}=\frac{33}{11}=3$$

$$y=\frac{\begin{vmatrix} 2 & 3 \\ 1 & 7 \end{vmatrix}}{\begin{vmatrix} 2 & -3 \\ 1 & 4 \end{vmatrix}}=\frac{14-3}{8-(-3)}=\frac{14-3}{8+3}=\frac{11}{11}=1$$

Answer: (3,1)