parametric

$$\ell(t) = \begin{bmatrix} p_1 \\ p_2 \end{bmatrix} + t\begin{bmatrix} v_1 \\ v_2 \end{bmatrix}$$

implicit

$$a x_1 + b x_2 + c = \emptyset$$

$$a = \begin{bmatrix} -v_2 \\ v_1 \end{bmatrix}$$

where $a_1 = a_1$ & $b = a_2$

$$c = -(a_1 p_1 + a_2 p_2)$$

line 1

$$p = \begin{bmatrix} 5 \\ 5 \end{bmatrix} \quad v = \begin{bmatrix} 0 \\ 1 \end{bmatrix} \longrightarrow a = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$$

$$c = -(-1(5) + \emptyset(5))$$
$$= -(-5) + \emptyset)$$
$$= -(-5)$$
$$= 5$$

$$-1x + \emptyset x_2 + 5 = \emptyset$$

line 2

$$p = \begin{bmatrix} -30 \\ 6 \end{bmatrix} \quad v = \begin{bmatrix} 10 \\ 0 \end{bmatrix} \quad \overset{?}{a} = \begin{bmatrix} 0 \\ 10 \end{bmatrix}$$

$$c = -(\emptyset(-30) + 10(6))$$
$$= -(60)$$
$$= -60$$

$$0x_1 + 10x_2 - 60 = \emptyset$$

line 3

$$p = \begin{bmatrix} -11 \\ -11 \end{bmatrix} \quad v = \begin{bmatrix} 14 \\ 14 \end{bmatrix} \quad a = \begin{bmatrix} 14 \\ 14 \end{bmatrix}$$

$$c = -(-14(-11) + 14(-11))$$
$$= -(+154 - 154)$$
$$= 1\emptyset$$

$$14x_1 + 14x_2 + \emptyset = \emptyset$$

line 4

$$p = \begin{bmatrix} -12 \\ 20 \end{bmatrix} \quad v = \begin{bmatrix} 3 \\ -1 \end{bmatrix} \quad a = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$$

$$c = -(1(-12) + 3(20))$$
$$= -(-12 + 60)$$
$$= -(48)$$
$$= -48$$

$$1x_1 + 3x_2 - 48 = \emptyset$$

line 5

$$p = \begin{bmatrix} 0 \\ 5 \end{bmatrix} \quad v = \begin{bmatrix} 10 \\ 1 \end{bmatrix} \quad a = \begin{bmatrix} -1 \\ 10 \end{bmatrix}$$

$$c = -(-1(\emptyset) + 10(5))$$
$$= -(50)$$
$$= -50$$

$$-x_1 + 10x_2 - 50 = \emptyset$$