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Q1

a) FIRST FIND LINE OF INTERSECTION:

$$\left[ \begin{array}{ccc|c} -1 & 2 & 1 & 0 \\ 1 & 0 & 1 & -1 \end{array} \right]$$

5 points

$$\downarrow$$
$$\left[ \begin{array}{ccc|c} 1 & -2 & -1 & 0 \\ 1 & 0 & 1 & -1 \end{array} \right]$$

$$\downarrow$$
$$\left[ \begin{array}{ccc|c} 1 & -2 & -1 & 0 \\ 0 & 2 & 2 & -1 \end{array} \right]$$

$$\downarrow$$
$$\left[ \begin{array}{ccc|c} 1 & 0 & 1 & -1 \\ 0 & 1 & 1 & -1/2 \end{array} \right]$$

x, y LEADING  
z FREE

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -1 \\ -1/2 \\ 0 \end{bmatrix} + z \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix}$$

-2-

FIND CROSS PRODUCT OF TWO DIRECTION VECTORS:

$$\begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix} \times \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 5 \\ -3 \\ 2 \end{bmatrix}$$

PLANE EQUATION:

$$5x - 3y + 2z + d = 0$$

SUBSTITUTE A KNOWN POINT IN THE PLANE:

$$5(1) - 3(0) + 2(0) + d = 0$$

$$\therefore d = -5$$

$$5x - 3y + 2z - 5 = 0$$