$x_2 \neq 0$, $x_3 \neq 0$, if we consider

$$\begin{pmatrix} \alpha_{11}-\alpha_{10}, & \alpha_{12}-\alpha_{10}, & \alpha_{13}-\alpha_{10} \\ \alpha_{21}-\alpha_{20}, & \alpha_{22}-\alpha_{20}, & \alpha_{23}-\alpha_{20} \\ \alpha_{31}-\alpha_{30}, & \alpha_{32}-\alpha_{30}, & \alpha_{33}-\alpha_{30} \end{pmatrix},$$

its determinant is zero, which contradicts to $(**)$. Thus in general, we conclude that if $v_1, \cdots v_q$ are linearly dependent at $X \in \mathbb{P}^n$, then all but q of the homogeneous coordinates of X vanish, i.e.,

$$D_q = \overline{\bigcup_{\#I=q} P_{i_1} \cdot P_{i_2} \cdots P_{i_q}}.$$

We are going to show that $\{v_1, v_2\}$ is generic.

$$v_1 = (\alpha_{11}-\alpha_{10})\, x_1 \frac{\partial}{\partial x_1} + (\alpha_{12}-\alpha_{10})\, x_2 \frac{\partial}{\partial x_2}$$
$$v_2 = (\alpha_{21}-\alpha_{20})\, x_1 \frac{\partial}{\partial x_1} + (\alpha_{22}-\alpha_{20})\, x_2 \frac{\partial}{\partial x_2}$$

$$\mathbb{C}^2 \xrightarrow{v_1} \mathbb{C}^2 \times \mathbb{C}^2$$

$$(x_1, x_2) \longmapsto (x_1, x_2, (\alpha_{11}-\alpha_{10})x_1, (\alpha_{12}-\alpha_{10})x_2)$$

$$\mathbb{C}^2 \xrightarrow{v_2} \mathbb{C}^2 \times \mathbb{C}^2$$

$$(x_1, x_2) \longmapsto (x_1, x_2, (\alpha_{21}-\alpha_{20})x_1, (\alpha_{22}-\alpha_{20})x_2)$$

(i) $(x_1, x_2) = (1, 0)$.

$\{(x_1, x_2, k(\alpha_{11}-\alpha_{10})x_1, k(\alpha_{12}-\alpha_{10})x_2)\}$ is the subspace E' of E spanned by v_1.