Note that. $v(z) = \sum_{\substack{j=1 \\ k=1}}^{n} (a^{\nu}_{jk} + \sqrt{-1}\, b^{\nu}_{jk})\, z_j \frac{\partial}{\partial z_k}$

$= \sum (a^{\nu}_{jk} + \sqrt{-1}\, b^{\nu}_{jk})(x_{2j-1} + \sqrt{-1}\, x_{2j}) \frac{\partial}{\partial z_k}$

$= \sum (a^{\nu}_{jk} x_{2j-1} - b^{\nu}_{jk} x_{2j} + \sqrt{-1}\, b^{\nu}_{jk} x_{2j-1} + \sqrt{-1}\, a^{\nu}_{jk} x_{2j}) \frac{\partial}{\partial z_k}$

$= \sum (a^{\nu}_{jk} + \sqrt{-1}\, b^{\nu}_{jk})\, x_{2j-1} \frac{\partial}{\partial z_k} + \sum (-b^{\nu}_{jk} + \sqrt{-1}\, a^{\nu}_{jk})\, x_{2j} \frac{\partial}{\partial z_k}.$

$$\Rightarrow A^{\nu} = \begin{pmatrix} a^{\nu}_{11}, & a^{\nu}_{12}, & \cdots & a^{\nu}_{1n} \\ -b^{\nu}_{11}, & -b^{\nu}_{12}, & \cdots & -b^{\nu}_{1n} \\ a^{\nu}_{21}, & a^{\nu}_{22} & \cdots & a^{\nu}_{2n} \\ \vdots & \vdots & & \vdots \\ a^{\nu}_{n1}, & a^{\nu}_{n2} & \cdots & a^{\nu}_{nn} \\ -b^{\nu}_{n1}, & -b^{\nu}_{n2} & \cdots & -b_{nn} \end{pmatrix}$$

$$B^{\nu} = \begin{pmatrix} b^{\nu}_{11}, & b^{\nu}_{12} & \cdots & b^{\nu}_{1n} \\ a^{\nu}_{11}, & a^{\nu}_{12} & \cdots & b^{\nu}_{2n} \\ \vdots & \vdots & & \vdots \\ a_{n1}, & a_{n2} & \cdots & a_{nn} \\ b_{n1}, & b_{n2} & \cdots & b_{nn} \end{pmatrix}.$$

According to the definition of the index on P422, the index of v' at P_ν is the determinant sgn of the following matrix.

$$C = \begin{pmatrix} a^{\nu}_{11}, & b^{\nu}_{11}, & a^{\nu}_{12}, & b^{\nu}_{12}, & \cdots & a^{\nu}_{1n}, & b^{\nu}_{1n} \\ -b^{\nu}_{11}, & a^{\nu}_{11}, & -b^{\nu}_{12}, & a^{\nu}_{12}, & \cdots & -b^{\nu}_{1n}, & a^{\nu}_{1n} \\ \vdots & & & & & & \\ a^{\nu}_{n1}, & b^{\nu}_{n1}, & a^{\nu}_{n2}, & b^{\nu}_{n2} & \cdots & a^{\nu}_{nn}, & b^{\nu}_{nn} \\ -b^{\nu}_{n1}, & a^{\nu}_{n1}, & -b^{\nu}_{n2}, & a_{n2}, & \cdots & -b^{\nu}_{nn}, & a_{nn} \end{pmatrix}$$