$$V^1\{(A_{11}A_{21}A_{32}+A_{21}A_{31}A_{12}+A_{31}A_{11}A_{22}-A_{11}A_{31}A_{22}-A_{21}A_{11}A_{32}-A_{31}A_{21}A_{12})dx^1\wedge dx^2$$
$$+(A_{11}A_{21}A_{33}+A_{21}A_{31}A_{13}+A_{31}A_{11}A_{23}-A_{11}A_{31}A_{23}-A_{21}A_{11}A_{33}-A_{31}A_{21}A_{13})dx^1\wedge dx^3$$
$$+(A_{11}A_{22}A_{33}+A_{21}A_{32}A_{13}+A_{31}A_{12}A_{23}-A_{11}A_{32}A_{23}-A_{21}A_{12}A_{33}-A_{31}A_{22}A_{13})dx^2\wedge dx^3\}$$
$$V^2\{(A_{12}A_{21}A_{32}+A_{22}A_{31}A_{12}+A_{32}A_{11}A_{22}-A_{12}A_{31}A_{22}-A_{22}A_{11}A_{32}-A_{32}A_{21}A_{12})dx^1\wedge dx^2$$
$$+(A_{12}A_{21}A_{33}+A_{22}A_{31}A_{13}+A_{32}A_{11}A_{23}-A_{12}A_{31}A_{23}-A_{22}A_{11}A_{33}-A_{32}A_{21}A_{13})dx^1\wedge dx^3$$
$$+(A_{12}A_{22}A_{33}+A_{22}A_{32}A_{13}+A_{32}A_{12}A_{23}-A_{12}A_{32}A_{23}-A_{22}A_{12}A_{33}-A_{32}A_{22}A_{13})dx^2\wedge dx^3\}$$
$$V^3\{(A_{13}A_{21}A_{32}+A_{23}A_{31}A_{12}+A_{33}A_{11}A_{22}-A_{13}A_{31}A_{22}-A_{23}A_{11}A_{32}-A_{33}A_{21}A_{12})dx^1\wedge dx^2$$
$$(A_{13}A_{21}A_{33}+A_{23}A_{31}A_{13}+A_{33}A_{11}A_{23}-A_{13}A_{31}A_{23}-A_{23}A_{11}A_{33}-A_{33}A_{21}A_{13})dx^1\wedge dx^3$$
$$(A_{13}A_{22}A_{33}+A_{23}A_{32}A_{13}+A_{33}A_{12}A_{23}-A_{13}A_{32}A_{23}-A_{23}A_{12}A_{33}-A_{33}A_{22}A_{13})dx^2\wedge dx^3$$

$$= V^1 \det A\, dx^2\wedge dx^3 + V^2 \det A\, dx^3\wedge dx^1 + V^3 \det A\, dx^1\wedge dx^2$$

$$= \det A\, i_2(\mathbb{V})$$

□

- $A\in$ $\Rightarrow$ $\det A = -1$, or 1

$A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$ の場合 (x,y 平面についての鏡像)

△ 再定義　極性ベクトル … 鏡に映して符号が変わる。

軸性ベクトル … 鏡に映して符号が変わらない。