

$$\vec{w} = \cos \alpha \vec{x} + \sin \alpha \vec{y}$$

$$\vec{V}_1 = \cos \beta (\cos \alpha \vec{x} + \sin \alpha \vec{y}) + \sin \beta \vec{z}$$

$$\vec{V}_2 = -\sin \beta (\cos \alpha \vec{x} + \sin \alpha \vec{y}) + \cos \beta \vec{z}$$

$$\begin{aligned} \vec{w} = & \cos \gamma [\cos \beta (\cos \alpha \vec{x} + \sin \alpha \vec{y}) + \sin \beta \vec{z}] + \sin \beta \\ & + \sin \gamma [-\sin \beta (\cos \alpha \vec{x} + \sin \alpha \vec{y}) + \cos \beta \vec{z}] \\ & + \cos \beta \vec{z} \end{aligned}$$

$$\vec{OD} = \vec{OA} + \vec{AB} + \vec{BC} + \vec{CD}$$

$$\vec{OD} = \vec{OA} \left[ \cos \alpha [a_1 + \cos \beta (b + c(\cos \gamma + \sin \gamma))] \right. \\ \left. \sin \alpha [a_2 + \cos \beta (b + c(\cos \gamma + \sin \gamma))] \right. \\ \left. a_3 + \sin \beta (b + c(\sin \gamma + \cos \gamma))] \right]$$

$$\vec{w} = \begin{pmatrix} \cos \alpha (\cos \beta \cos \gamma - \sin \gamma \sin \beta) \\ \sin \alpha (\cos \beta \cos \gamma - \sin \beta \sin \gamma) \\ \cos \gamma \sin \beta + \cos \beta \sin \gamma \end{pmatrix}$$

$$= \begin{pmatrix} \cos \alpha \cos (\beta + \gamma) \\ \sin \alpha \cos (\beta + \gamma) \\ \sin (\beta + \gamma) \end{pmatrix}$$

$$\vec{A_0} = (4, 8)$$

$$\vec{B_0} = (6, 4 \sim 6, 8)$$

$$\vec{C_0} = (9, 2 \sim 9, 3)$$