

Name_____ Student number_____

Assignment 5

Derive the gradient expressions of (α, β, γ) -coordinate system, when the mapping defining the coordinate system is given by

$$\vec{r}(\alpha, \beta, \gamma) = (uv\alpha + \sqrt{1-u^2}\gamma)\vec{i} + \beta\vec{j} + (u\gamma - v\sqrt{1-u^2}\alpha)\vec{k}$$

in which $u \in [-1, 1]$ and $v > 0$ are parameters.