Exercices ISCG – Part 1 : Mathematical Background(Version 1.2)- A20

Exercice 1 : Determine the relationship between the cartesian coordinate (a,b,c) and spherical coordinate (ρ,θ,φ).

Exercice 2 : Determine $\vec{v}^t$, $\vec{v}\,\vec{v}^t$, $\vec{v}^t\,\vec{v}$, $\mathrm{Tr}(\vec{v}\,\vec{v}^t)$

Exercice 3 : Demonstrate : $\overrightarrow{v^{\eta}} = \vec{\eta}\vec{\eta}^t\vec{v}$

Exercice 4 : Determine coordinates of P^{Δ}

Exercice 5 : Determine $\mathbf{W}^{\times}\vec{v}$

Exercice 6 : Determine $\varepsilon_{ijk}v_k$, $\varepsilon_{ijk}v_j$

Exercice 7 : Verify $\overrightarrow{x_2}$, $\overrightarrow{y_2}$ and $\overrightarrow{z_2}$ are a reference frame Determine $\boldsymbol{T}_{1\leftarrow 2}$ and $\boldsymbol{T}_{2\leftarrow 1}$

Exercice 8 : Determine the coordinate P in R2

Exercice 9 : Determine $\mathbf{H}_{\mathcal{L}\leftarrow\mathcal{G}}$

Exercice 10 : Determine $q_1 q_2$

Exercise 11 : Determine ; $\hat{a} + \hat{b}$; $\hat{a} - \hat{b}$; $\hat{a}\,\hat{b}$; $\frac{\hat{a}}{\hat{b}}$

Exercise 12 : determine $(a + \varepsilon b)^n$; $sin(\alpha + \varepsilon d)$; $cos(\alpha + \varepsilon d)$