Assignment (1)

Deadline : 8th of October 4:00 PM

Problem 1

Given that $\bar{A} = \bar{a}_x + \alpha\bar{a}_y + \bar{a}_z$ and $\bar{B} = \alpha\bar{a}_x + \bar{a}_y + \bar{a}_z$. If $\bar{A}$ and $\bar{B}$ are normal to each other, find α.

Problem 2

If $\bar{A} = \bar{a}_x + 3\bar{a}_z$ and $\bar{B} = 5\bar{a}_x + 2\bar{a}_y - 6\bar{a}_z$, find θ_{AB}

Problem 3

A vector field in "mixed" coordinate variables is given by

$$\bar{G} = \frac{x\cos\phi}{\rho}\bar{a}_x + \frac{2yz}{\rho^2}\bar{a}_y + \left(1 - \frac{x^2}{\rho^2}\right)\bar{a}_z$$

Express $\bar{G}$ completely in spherical system

Problem 4

Find the total surface area of the volume shown in figure 1

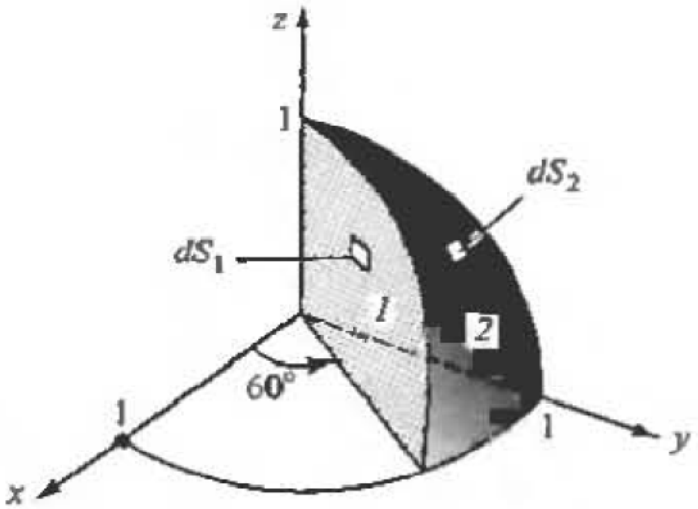

Figure (1)