

Lab problems for 5/2/15

Question1.

Given the vectors $A=2i+3j-k$, $B=4i-3j+2k$ and $C=i+2j-3k$.find

(i) a). $2A+B+C$ b). $3A+b-4C$ c). $|A|$ d). $|A+B+C|$

(ii) Find the unit vector $\lambda_a, \lambda_b, \lambda_c$ corresponding to vector A,B and C.

(iii) Find the direction cosines and direction angle α, β, γ of the vector A,B and C.

Question2.

If $A =5i+2j-7k$ and $B=-2i-3j+4k$ then transform $(3A+2B)$ to

(i) Cartesian co-ordinates to cylindrical or polar.

(ii) Cartesian co-ordinates to Spherical.

and find parameters (R, ϕ, Θ) associated with the co-ordinate transformation of $3A+2B$.

Question3

If $A=2a_x+ a_y - a_z$ and $B=a_x- 2a_y + 0a_z$, find:

(a) Scalar product

(b) Vector product

(c) The angle between two vectors

(d) Scalar product $A \cdot A$

For all above find the unit vector.

Lab Assignment

Question4

Potential function is given as $z = xe^{-(x^2+y^2)}$. Plot scalar field against (x,y)