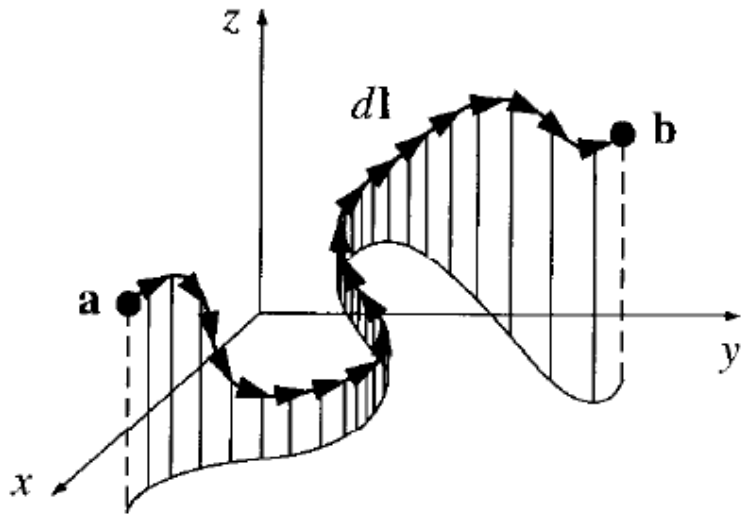
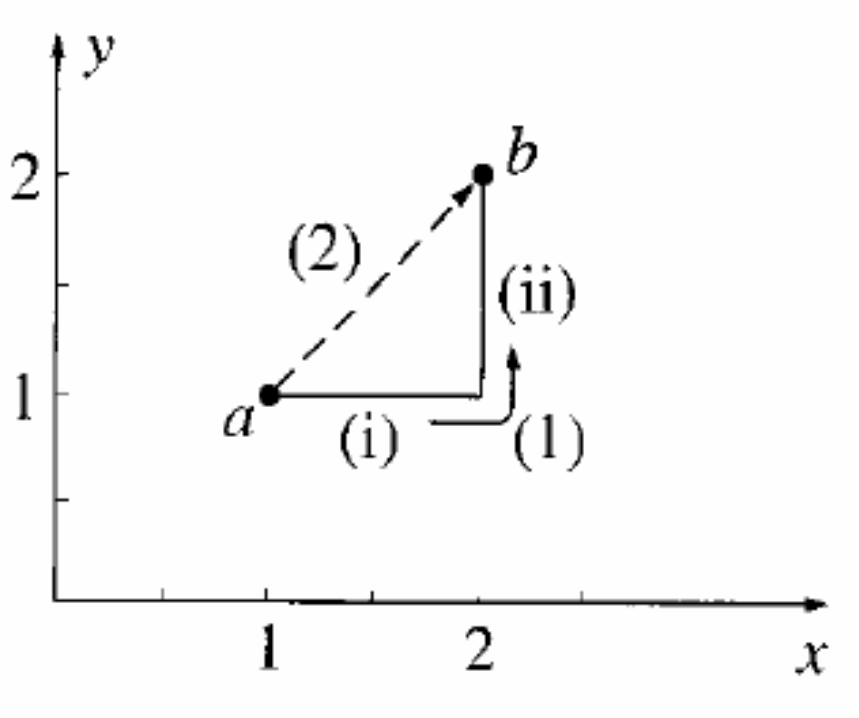
Vector Line Integration

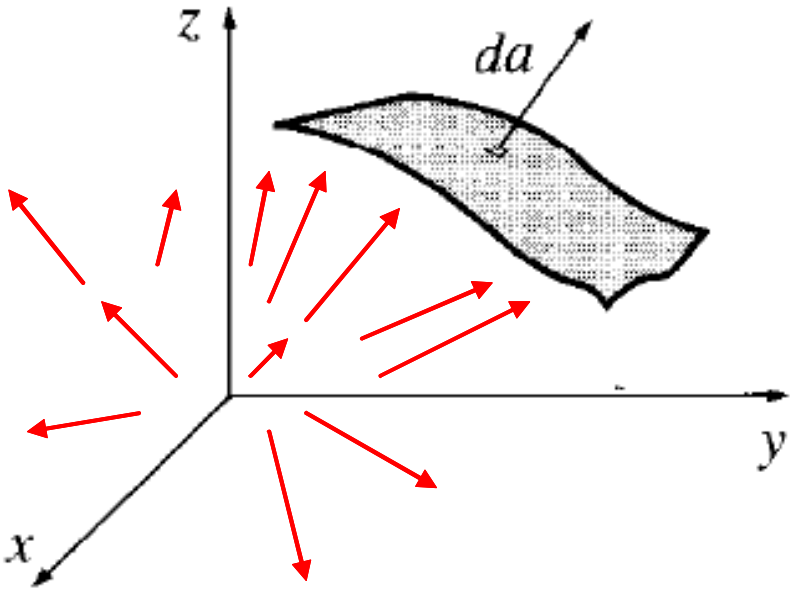


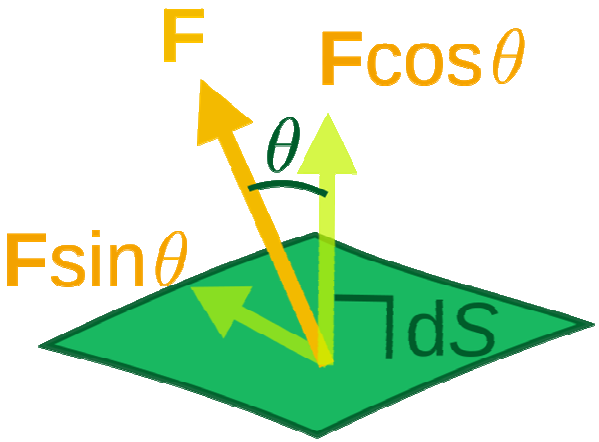
$(i) \quad \vec{V} = -y\hat{i} + x\hat{j}$

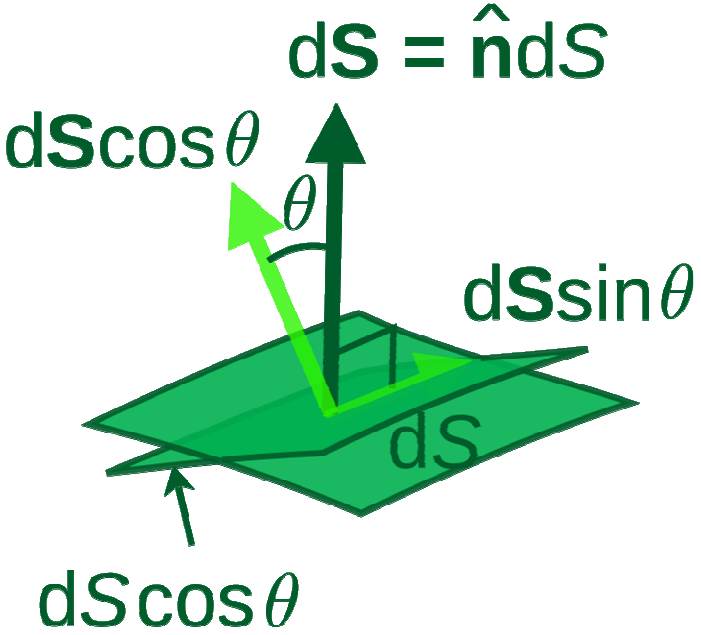
$(ii) \quad \vec{V} = x\hat{i} + y\hat{j}$



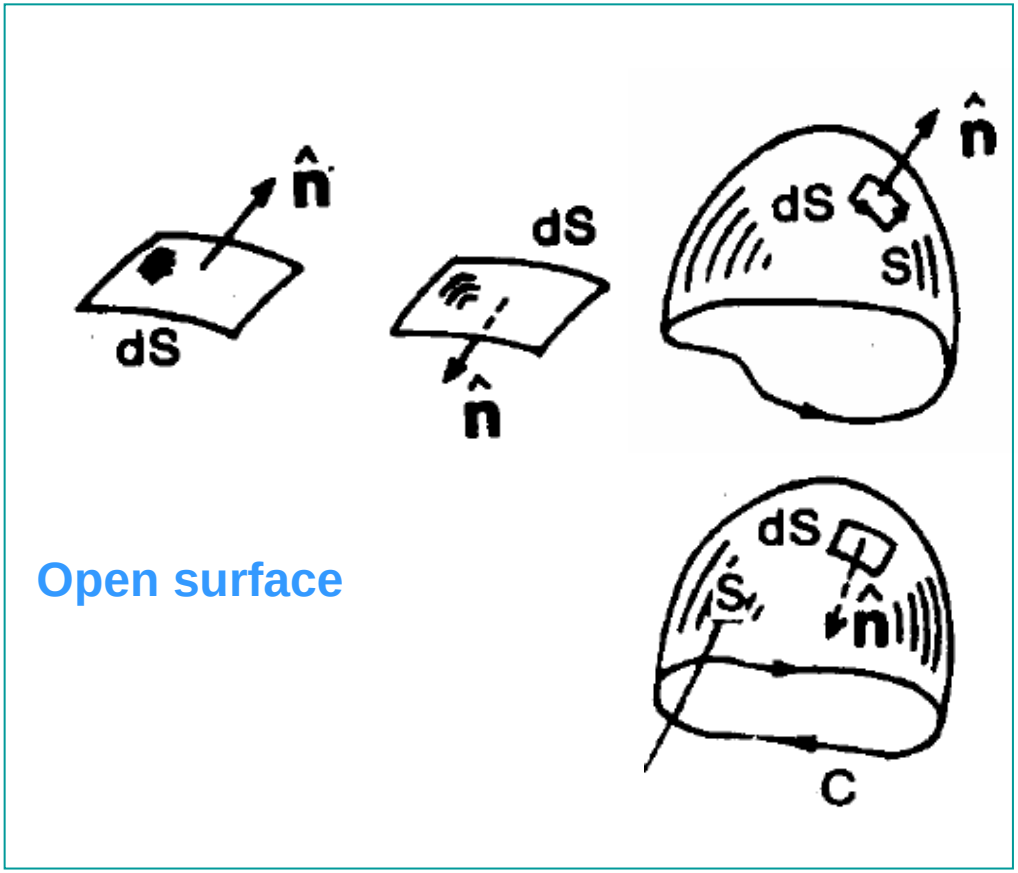
Vector Surface Integral


z
da
y
x

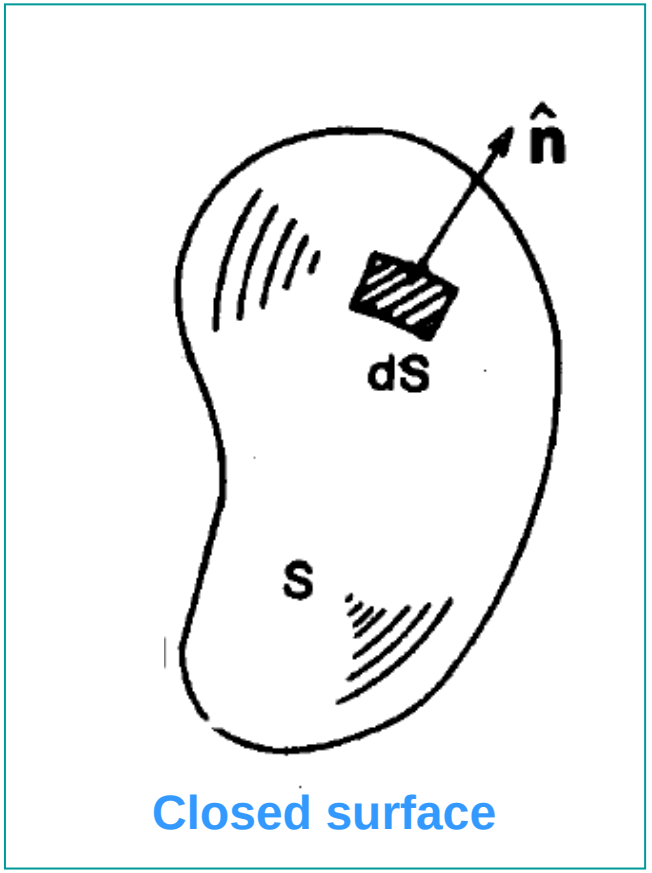

F
Fcosθ
θ
Fsinθ
dS


dS = n̂dS
dScosθ
θ
dSsinθ
dS
dScosθ

Vector surface Integral



Open surface



Closed surface

$(i)\quad \vec{V}_1 = -y\hat{i} + x\hat{j}$

$(ii)\quad \vec{V}_2 = -y\hat{i} + xy\hat{j}$

$(iii)\quad \vec{V}_3 = xy\hat{i} + yz\hat{j} + zx\hat{k}$