17th Oct. 19

$\varepsilon_{ijk}\sigma_{ij}$ $\varepsilon_{ijk}\sigma_{ij}$ $\nabla\times\nabla\varphi$.
symmetric

$[\nabla\times\nabla\varphi]_i = \varepsilon_{ijk}\nabla_j\nabla_k\varphi$

$= \varepsilon_{ijk}\frac{\partial}{\partial x_j}\frac{\partial}{\partial x_k}\varphi = 0$.

if $\varepsilon_{ijk}\sigma_{ij}=0$. then $\sigma_{ij}=\sigma_{ji}$

$A \Leftrightarrow B$. $6-3-2-1=0$.

$\Rightarrow 6=0, 3=0, 2=0, 1=0.$ ✗

$\varepsilon_{lmk}\varepsilon_{ijk}\sigma_{ij}=0$.

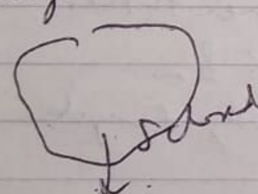
$(\delta_{li}\delta_{mj}-\delta_{lj}\delta_{mi})\sigma_{ij}=0$.

$\sigma_{lm}-\sigma_{ml}=0$. □.

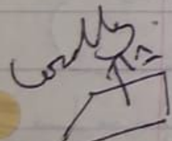
$\varepsilon_{ijk}\sigma_{ij}=\varepsilon_{ijk}\sigma_{ji} = -\varepsilon_{jik}\sigma_{ji} = -\varepsilon_{ijk}\sigma_{ij}$ □.

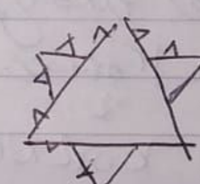
divergence thm. $\int_S F\cdot dS = \int_V \nabla\cdot F\, dV$

F diff bility



S closed.





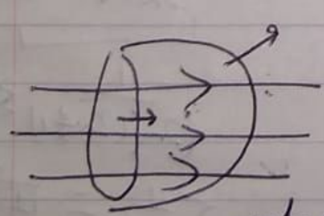
$\exists \triangle$ orientable.

$\int_V \nabla\cdot F\, dV = \int F\cdot dS + \int F\cdot dS$.

0 $= \pi a^2 w$.

$-\int w\, r\, dr\, d\theta = -w\int dS$

$= -w\pi a^2$



amt in = amt out.

$a\cdot\int \nabla p\, dV = a\cdot\int p\, dS$

a arbitrary. $a = e_1, e_2, e_3$.

$a\cdot(I_1 - I_2) = 0$.

$a = I_1 - I_2$

$|I_1 - I_2|^2 = 0$.

$I_1 - I_2 = 0 \Rightarrow I_1 = I_2$

$a_1b_1 + a_2b_2 + a_3b_3$

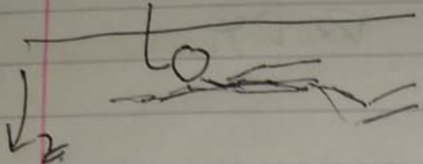
$= a_1c_1 + a_2c_2 + a_3c_3$

$\Rightarrow c_1 = b_1$

$c_2 = b_2$

$c_3 = b_3$. ✗

$\int \nabla p \, dV = \int p \, d\underline{S}$.



$p = \rho g z$

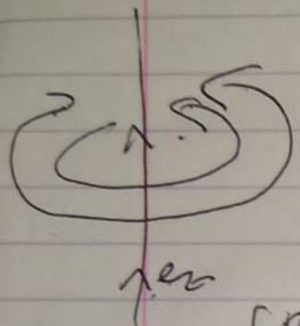
$\nabla p = \rho g \hat{z}$

$\int \nabla p \, dV = \int \rho g \hat{z} \, dV$

$= \rho g \hat{z} V$

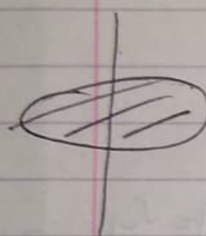
$= W \hat{z} = \int p \, d\underline{S}$

$= \int p \, \underline{n} \, dS$



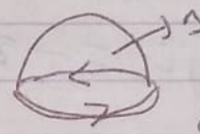
$\frac{B \, 2\pi}{\mu_0 I} = \frac{e_z \times \underline{r}}{r^2} = \frac{e_\theta}{r}$

$\int \underline{B} \cdot d\underline{r} = \int \frac{e_\theta}{r} \cdot a \, d\theta \, e_\theta = \int d\theta = 2\pi$.



$\int \nabla \times \underline{B} \cdot d\underline{S} = 0$. $\oint_C \underline{B} \cdot d\underline{r} = \int_S \nabla \times \underline{B} \cdot d\underline{S}$.

$\oint_C \underline{B} \cdot d\underline{r} = 2\pi$



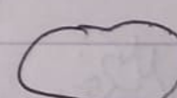
S the open

$\underline{B}$ diff the

S over the

$\exists \nabla \times B$

C closely simple.



Fourier analysis

Tom Korner

&

KORNER.

$\sum \frac{1}{n}$ $\sum \frac{(-1)^n}{n} = -1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} \cdots - \frac{1}{2n-1} + \frac{1}{2n} - \frac{1}{2n+1} \cdots$

$= 1 + \underbrace{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}}_{> \frac{1}{2}} + \underbrace{\frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8}}_{> \frac{1}{2}} \cdots$

$\frac{-1}{(2n)(2n+1)} \approx \frac{-1}{(2n)^2}$

$\sum \frac{1}{n^2} = \frac{\pi^2}{6}$.