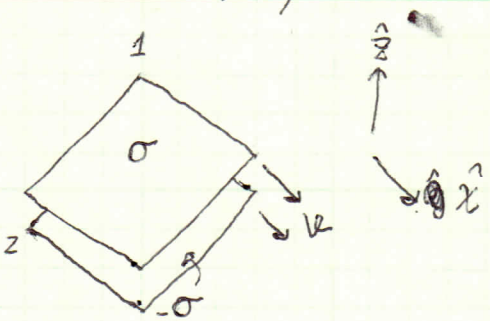
5.17



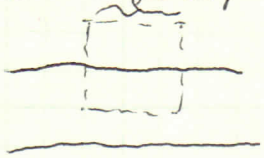
$K_1 = \sigma \vec{v} = \sigma v \hat{x}$

$K_2 = -\sigma \vec{v} = -\sigma v \hat{x}$

First Loop: 

$I_{enc} = 0 \Rightarrow B_{above} = B_{below}$

Using Eq. 58, $B_{above} = (-\mu_0/2) K_1 + (\mu_0/2) K_2 = -\frac{\mu_0}{2}(\sigma v - \sigma v) = 0$

Second Loop: 

$I_{enc} = K_1 l$

$\oint_k \vec{B} \cdot d\vec{l} = Bl \Rightarrow B = \mu_0 K_1 \hat{y}$

Alternatively, using Eq. 58,

$B = (\mu_0/2) K_1 - (\mu_0/2) K_2 = \frac{\mu_0}{2}(\sigma v - (-\sigma v)) = \frac{\mu_0}{2} \sigma v = \frac{\mu_0}{2} K_1$

So, $\vec{B}_{in} = \mu_0 \sigma v \hat{y}$

$$\vec{B} = \begin{cases} \mu_0 \sigma v \hat{y} & \text{inside} \\ 0 & \text{outside} \end{cases}$$