

Mid3 Review Problems

- 1) Two concentric solenoids are arranged to give a magnetic field of

$$\vec{B}(a < s < b) = B_0 \hat{z}, \vec{B}(s > b) = 0, \vec{B}(s < a) = 0.$$

a) Find $\vec{K}(s = a)$.

b) Find the outward pressure on the $s = a$ surface using $\mathcal{P}_{\text{out}} = \hat{s} \cdot \vec{K} \times \vec{B}_{\text{other}}$

- c) Find $\vec{A}(s)$ in the regions $s < a$, $a < s < b$, $s > b$ and show that $\vec{A}(s)$ is continuous at a and b . Confirm that your $\vec{A}(s)$ give the magnetic fields in all three regions.

d) Use $\frac{\partial \vec{A}_{>}}{\partial s} - \frac{\partial \vec{A}_{<}}{\partial s} = -\mu_0 \vec{K}(s = b)$ to find the surface current carried by the $s = b$ solenoid.