

$$k = k$$

$$\mathbf{R} = r\mathbf{e}_r + z\mathbf{e}_z$$

$$\mathbf{a} = a_r\mathbf{e}_r + a_z\mathbf{e}_z$$

$$\mathbf{A} = -k(\mathbf{a} \cdot \mathbf{R})\mathbf{R}^2\mathbf{e}_z = -k(a_r r^3 + a_r r z^2 + a_z r^2 z + a_z z^3)\mathbf{e}_z$$

$$\mathbf{B} = \nabla \times \mathbf{A} = -I * (\nabla \wedge \mathbf{A}) = k(3a_r r^2 + a_r z^2 + 2a_z r z)\mathbf{e}_\theta$$