1. Jackson 5.14: Calculate the magnetic fields everywhere. Skip the plots. For \( \mu \gg \mu_0 \) and \( b - a \ll a \) but with \( (\mu - \mu_0)(b - a) \gg \mu_0 b \) calculate the lowest order expressions for the magnetic field in the three regions. What is the size of the region where \( B \) is strongly affected by the cylinder. Estimate the magnetic field in the three regions based on simple physical arguments and check their consistency with your earlier expressions.

2. Jackson 5.18a,c
   
   Hint: you can use the results of 5.17 and 5.10a.

3. Jackson 5.19a

4. Jackson 5.22