

From Griffiths: 6.12, 6.14, 6.16, 6.17, 6.23a–b, 6.25

1. A long solenoid has 100 turns/m, a current of 1000. amps and an inside magnetic field of $6 \times 10^{-3}\text{T}$. Is the solenoid filled with a diamagnetic or paramagnetic material? Explain how you know.
2. Suppose space is divided into two regions, where region 1 is where $z < 0$, and region 2 has $z > 0$. Region 1 is free space, while region 2 is dielectric with $\epsilon_2 = 2\epsilon_0$. At $z = 0$, $\sigma_f = 0.2\text{C/m}^2$. $\vec{D}_1 = 3x\hat{x} + 4y^2\hat{y} + 4z\hat{z}$ and $\vec{H}_2 = 2\hat{x} + 5y^3\hat{y} + 5z\hat{z}$. Find \vec{E}_2 , \vec{D}_2 , \vec{B}_2 , \vec{E}_1 , \vec{D}_1 , \vec{B}_1 , and \vec{H}_1 .