Fields and Waves I, Fall 2000

Preparation Assignment - Due 10/16/2000

1. Find the inductance of a toriod with major axis R and minor axis a where $R >> a$. The toriod has N_1 turns that are equally spaced.

2. If we place a small toriod of major axis R and minor axis b where $b < a$ inside the first torus and having N_2 turns, find the mutual inductance between the two windings.

Preparation Assignment - Due 10/18/2000

1. Why do flux lines enter a highly permeable material normal to the surface?

2. A field of $H = 3\hat{a}_x + 4\hat{a}_y + 7\hat{a}_z$ in air impinges on a magnetic material with $\mu_r = 500$ which is oriented in the (x-y) plane. In other words the vector normal to the surface of the magnetic material points in the z direction. Find H and B in the magnetic material.