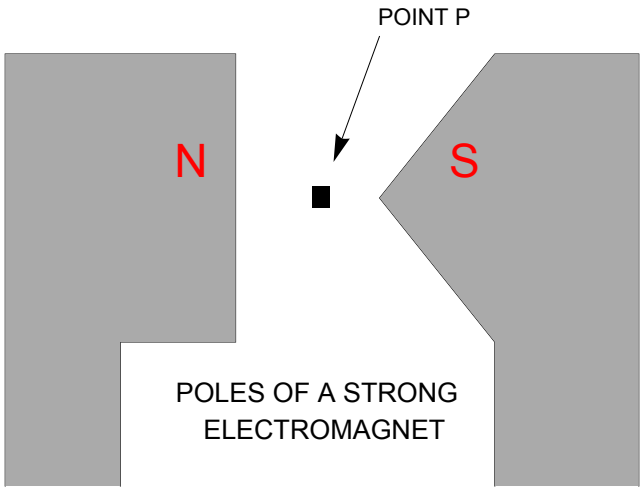
Homework Assignment #5 = quasi-static magnetic fields
due Friday Oct 4

To aid in grading, for each problem draw a box around your final answers using red pencil.

5-1. What is mu-metal, and what is it used for?

5-2. At point P, a paramagnetic object experiences a force toward the pointed pole; a diamagnetic object experience a force away from the pointed pole. Explain why, with basic equations.



5-3. In one paragraph with a figure, describe and explain how Faraday discovered electromagnetic induction.

5-4. In a few equations prove this theorem:

The work that must be supplied to a magnetic system to change the vector potential by $\vec{A} \rightarrow \vec{A} + \delta\vec{A}$ is

$$\delta W = \int \delta \vec{A} \bullet \vec{J}\, d^3 x\,.$$

5-5. In one paragraph with two equations, describe and explain the phenomenon of ***magnetic diffusion.***