11/27–Maxwell's Equations and the Displacement Current

1. The integral form of Maxwell's equations is usually the one you want to use to solve problems. Yet the purple sheet gives them all in differential form. (I did them all the other way in class, but try to do it without looking!)

   (a) Starting from the differential form of Gauss's Law:

   $$\nabla \cdot \vec{E} = \frac{\rho}{\epsilon_0}$$

   derive the differential form:

   $$\oint \vec{E} \cdot d\vec{a} = \frac{q_{enc}}{\epsilon_0}$$

   (b) Starting from the differential form of Faraday's Law:

   $$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

   derive the differential form:

   $$\oint \vec{E} \cdot d\vec{\ell} = -\frac{d\Phi_B}{dt}$$

2. Do Griffiths, problem 7.34

Another Faraday's Law problem, for practice!

3. Griffiths 7.16

And if there's time, any old review problems you'd like to do

4. Practice Problems of your choice! If you haven't finished the last tutorial (from before break), I'd recommend that, and or Griffths problems 7.8, 10,