

## PHY 202 2003; Homework 10

Due Thursday April 17 at 5:00 PM at SE 227.

The third test in this class will be held on Wednesday, April 16. It will cover primarily the material in Homeworks 7–9. I will hand out a test preparation sheet for you to fill out.

1. Read the biography of Maxwell which can be found at the bottom of the course web page <http://www.geneva.edu/~bvds/phy202/>. Answer the following questions in a manner that convinces me that you read the article.
  - (a) List seven important dates mentioned in the biography. (Include the year and what happened).
  - (b) Discuss something that impressed you about Maxwell's early life.
  - (c) What does the article suggest about a modern Liberal Arts education of today? Do you agree? (The classical education described in this article was characteristic of college education in Europe and America before 1900. In fact, Geneva college also had such a curriculum during its first fifty years.)
  - (d) What did Maxwell think about Baptists? Explain.
  - (e) There are a large number of quotes in the article where Maxwell discusses the relation between faith and science. In particular, Maxwell urges caution in using the latest scientific findings as "proofs of Christianity." Why did he say this?
2. Read the biography of Faraday which can be found at the bottom of the course web page <http://www.geneva.edu/~bvds/phy202/>.
  - (a) Tell me something interesting about the Sandemans.
  - (b) How did Faraday's religious beliefs affect his work as a scientist. (Also, in what way were the two separate?)
3. In lecture, we discussed plane waves that were solutions to Maxwell's equations. If the electric field of a traveling wave is

$$\mathbf{E} = E_0 \hat{x} \sin(kz - \omega t)$$

find  $\nabla \times \mathbf{E}$ .

*He who mocks the poor shows contempt for their Maker;  
whoever gloats over disaster will not go unpunished.  
Prov. 17:5*