Solutions, 311-XXIV

April 18, 2003

4(4/17) Problems
Schaum's, p.118(18),p.129(32),p.134(67*,68*,69*)

1 Problem 134-67

A vector $\mathbf{B}$ is always normal to a given closed surface S. Show that

$$\int\int\int_V \nabla \times \mathbf{B} dV = 0$$

where V is the region bound by S.

Solution:

2 Problem 134-68

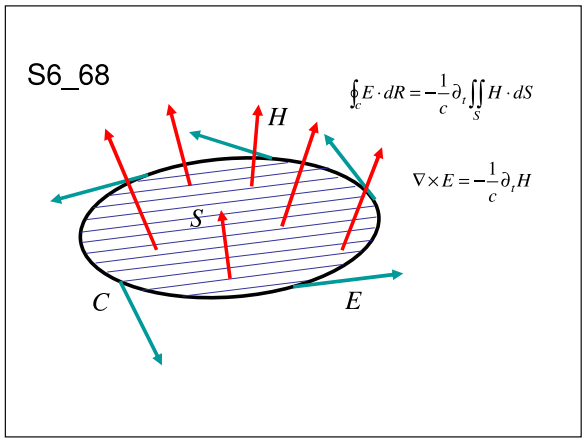
If

$$\oint_C \mathbf{E} \cdot d\mathbf{R} = -\frac{1}{c}\partial_t \int\int_S \mathbf{H} \cdot d\mathbf{S} \ ,$$

where S is any surface bounded by the closed curve C, show that

$$\nabla \times \mathbf{E} = -\frac{1}{c}\partial_t \mathbf{H} \ .$$

Solution:



1

3 Problem 134-69

Prove

$$\oint_C \phi d\mathbf{R} = \int\int_S d\mathbf{S} \times \nabla\phi \ .$$

Solution: