

## Study Material

### Text Book

Elements of Electromagnetics, 7<sup>th</sup> Ed.  
Matthew N. O. Sadiku  
Oxford University Press

### Review Mathematics of Electromagnetics

Review Vector Algebra  
Chapter 1, pp. 3-23

Review Coordinate Systems & Transformations  
Chapter 2, pp. 31-52.

Review Vector Calculus  
Chapter 3, pp. 58-98.

### Study Maxwell's Equations

Read Maxwell's Equations  
Chapter 9, pp. 420-461

## Problems

### Problem #1

Calculate the gradient of  $f(x, y, z) = 2 \sin x - xy^2z + xe^y$  at point (2,3,5).

### Problem #2

Solve the following differential equation and boundary conditions.

$$\frac{d^2 f}{dz^2} - \gamma^2 f = 0 \quad f(0) = 1 \quad f'(0) = 0$$

### Problem #3

Given the electric field  $\vec{E}(z, t) = A \cos[\omega(t - z/c)] \hat{a}_y$ , determine the time-dependent magnetic field intensity  $\vec{H}(z, t)$  in free space.