Homework 1
Physics 313
Fall 2026

Due 12:30 PM, Tuesday, 8 September, 2026 as an upload to ELMS

All problems are from Griffiths *Introduction to Electrodynamics* 5th Edition

1) **Griffiths Problem 1.2** **[Associative property of cross-product]**
2) **Griffiths Problem 1.7** **[Find $\boldsymbol{\mathcal{r} = r - r'}$]**
3) **Griffiths Problem 1.12** **[The gradient]**
4) **Griffiths Problem 1.15** **[The curl]**
5) **Griffiths Problem 1.16** **[Sketch of $\hat{\boldsymbol{r}}/r^2$]**
6) **Griffiths Problem 1.18** **[The divergence]**
7) **Griffiths Problem 1.22** **[Meaning of $\vec{A} \cdot \vec{\nabla}$]**
8) **Griffiths Problem 1.26** **[The Laplacian]**
9) **Griffiths Problem 1.29** **[Line integral]**
10) **Griffiths Problem 1.34** **[Stoke's theorem]**
11) **Griffiths Problem 1.38** **[Spherical coordinates unit vectors]**
12) **Griffiths Problem 1.39** **[Divergence theorem]**

EXTRA CREDIT:

Solve for the position $y(t)$ of a damped oscillator circuit initially "at rest" subjected to a delta function driving force for t ≥ 0:

$$\frac{d^2y}{dt^2} + 2\beta\frac{dy}{dt} + \omega^2 y = A\delta(t), \qquad y(0) = \left.\frac{dy}{dt}\right|_0 = 0$$

What is the physical interpretation of the result?
(Hint: use Laplace transforms)