

Electricity and Magnetism, PHYS 350 Problem set 1:

1. Problem 2.1 (2.1).
2. Problem 2.2 (2.2).
3. Problem 2.7 (2.7). Do NOT use Gauss's law!
4. Problem 2.10 (2.10), but find the flux through all the faces of the cube.
5. (a) Consider the potential function $\underline{C}\cdot\underline{r}$ where \underline{C} is a constant vector. What is $\underline{E}(\underline{r})$?
(b) What is the potential $V(\underline{r})$ for a uniform electric field of strength \underline{E}_0 and direction \hat{x} ?
6. Problem 2.24 (2.24).
7. Problem 2.26 (2.26).
8. Problem 2.34 (2.32).
9. Problem 2.35 (2.33).

10. Evaluate the interaction energy:

$$U_{12} = \epsilon_0 \int \underline{E}_1 \cdot \underline{E}_2 d\tau$$

for two point charges separated by d . \underline{E}_1 is the field of q_1 and \underline{E}_2 is that of q_2 .

Supplementary problems A

- A1. Problem 1.8 (1.8).
- A2. Problem 1.16 (1.16).
- A3. Problem 1.21 (1.20).
- A4. Problem 1.29 (1.28).
- A5. Problem 1.30 (1.29).
- A6. Problem 1.31 (1.30).
- A7. Problem 1.34 (1.33).
- A8. Problem 1.36 (1.35).
- A9. Problem 1.45 (1.44).
- A10. Problem 1.44 (1.43).
- A11. Problem 1.48 (1.47).
- A12. Problem 1.59 (1.58).

(Numbers from Griffiths book, 4th edition; in parentheses, to the 3rd edition)