

Homework #7

1. Problem 4.1 in 6/E and 7/E (also 4.1 in Answer Sheet and 5/E)
2. Problem 4.2 in 6/E and 7/E (also 4.2 in Answer Sheet and 5/E)
3. Problem 4.12 in 6/E and 7/E (4.10 in Answer Sheet and 5/E)
4. Problem 4.13 in 6/E and 7/E (i.e. 4.11 in Answer Sheet and 5/E)

4.11* Charge $q_1 = 6 \mu\text{C}$ is located at (1 cm, 1 cm, 0) and charge q_2 is located at (0, 0, 4 cm). What should q_2 be so that \mathbf{E} at (0, 2 cm, 0) has no y -component?

5. Problems 4.22 and 4.23 in 6/E and 7/E (i.e. 4.20 & 4.21 in Answer Sheet and 5/E)

4.20 Given the electric flux density

$$\mathbf{D} = \hat{\mathbf{x}}2(x + y) + \hat{\mathbf{y}}(3x - 2y) \quad (\text{C/m}^2)$$

determine

- (a) ρ_v by applying Eq. (4.26).
- (b) The total charge Q enclosed in a cube 2 m on a side, located in the first octant with three of its sides coincident with the x -, y -, and z -axes and one of its corners at the origin.
- (c) The total charge Q in the cube, obtained by applying Eq. (4.29).

4.21* Repeat Problem 4.20 for $\mathbf{D} = \hat{\mathbf{x}}xy^3z^3$ (C/m²).