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)


4. Problem 4.13 in 6/E and 7/E (i.e. 4.11 in Answer Sheet and 5/E)
   4.11* Charge $q_1 = 6 \, \mu C$ 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
   \[ \mathbf{D} = \hat{x}2(x + y) + \hat{y}(3x - 2y) \quad (\text{C/m}^2) \]
   determine
   (a) $\rho_v$ 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 $\mathbf{D} = \hat{x}xy^3z^3 \quad (\text{C/m}^2)$. 