02 – Electric fields (Ch. 22)

$k = 1/4\pi\varepsilon_0 = 8.99 \cdot 10^9\ \mathrm{N\ m^2/C^2}$; $e = 1.60 \cdot 10^{-19}$

4) Two charged particles are attached to an *x* axis: Particle 1 of charge $-2.00 \cdot 10^{-7}$ C is at position *x* = 6.00 cm and particle 2 of charge $+2.00 \cdot 10^{-7}$ C is at position x = 21.0 cm. Midway between the particles, what is their net electric field in unit-vector notation?

7) Four particles form a square of edge length a = 5.00 cm and have charges q_1 = +10.0 nC, q_2 = -20.0 nC, q_3 = +20.0 nC, and q_4 = -10.0 nC. In unit-vector notation, what net electric field do the particles produce at the square's center?

19) The figure shows an electric dipole.What are the (a) magnitude and (b) direction (relative to the positive direction of the x axis) of the dipole's electric field at point P, located at distance r >> d?