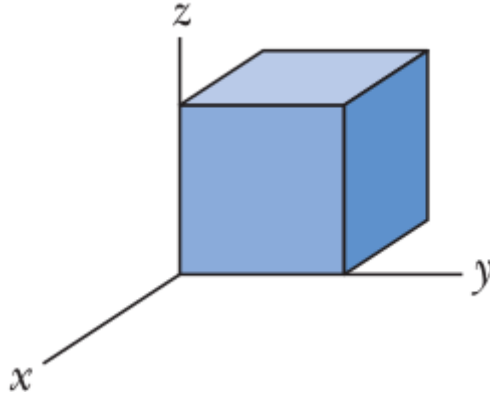# 03 – Gauss Law (Ch. 23)

$k = 1/4\pi\varepsilon_0 = 8.99 \cdot 10^9\,\text{N m}^2/\text{C}^2$; $e = 1.60 \cdot 10^{-19}$; $\varepsilon_0 = 8.854 \cdot 10^{-12}$ F/m

10) The figure shows a closed Gaussian surface in the shape of a cube of edge length 2.00 m. It lies in a region where the nonuniform electric field is given by $\mathbf{E} = (3.00x + 4.00)\hat{\imath} + 6.00\hat{\jmath} + 7.00\hat{k}$ N/C, with x in meters. What is the net charge contained by the cube?

24) The figure shows a section of a long, thin-walled metal tube of radius R = 3.00 cm, with a charge per unit length of $\lambda = 2.00\ 10^{-8}$ C/m. What is the magnitude E of the electric field at radial distance (a) r = R/2.00 and (b) r = 2.00R? (c) Graph E versus r for the range r = 0 to 2.00R.