36. The charge distribution in this problem is equivalent to that of an infinite sheet of charge with surface charge density $\sigma = 4.50 \times 10^{-12}$ C/m^2 plus a small circular pad of radius R = 1.80 cm located at the middle of the sheet with charge density $-\sigma$. We denote the electric fields produced by the sheet and the pad with subscripts 1 and 2, respectively. Using Eq. 22-26 for $\vec{E}_2$, the net electric field $\vec{E}$ at a distance z = 2.56 cm along the central axis is then

$$\vec{E} = \vec{E}_1 + \vec{E}_2 = \left(\frac{\sigma}{2\varepsilon_0}\right)\hat{\mathrm{k}} + \frac{(-\sigma)}{2\varepsilon_0}\left(1 - \frac{z}{\sqrt{z^2 + R^2}}\right)\hat{\mathrm{k}} = \frac{\sigma z}{2\varepsilon_0\sqrt{z^2 + R^2}}\hat{\mathrm{k}}$$

$$= \frac{(4.50\times10^{-12}\ \mathrm{C/m^2})(2.56\times10^{-2}\ \mathrm{m})}{2(8.85\times10^{-12}\ \mathrm{C^2/N\cdot m^2})\sqrt{(2.56\times10^{-2}\ \mathrm{m})^2 + (1.80\times10^{-2}\ \mathrm{m})^2}}\hat{\mathrm{k}} = (0.208\ \mathrm{N/C})\,\hat{\mathrm{k}}$$