a) sphere of charge

Shell theorem

Electric field due to a dipole

\[ E = E_+ + E_- = \frac{9}{4\pi \varepsilon_0 R^2} + \frac{-9}{4\pi \varepsilon_0 \frac{1}{R}} \]

\[ = \frac{1}{4\pi \varepsilon_0} \left[ \frac{9}{R^2} - \frac{9}{R} \right] \]

\[ = \frac{9}{4\pi \varepsilon_0} \left[ \frac{1}{(2-d)^2} - \frac{1}{(2+d)^2} \right] \]

\[ = \frac{9}{4\pi \varepsilon_0} \left[ \frac{1}{(1-\frac{d}{2})^2} - \frac{1}{(1+\frac{d}{2})^2} \right] \]