the $\quad F_{bowl} = \int (\overleftrightarrow{T} \cdot d\vec{a})_z = \frac{1}{4\pi\epsilon_o} \frac{Q^2}{8R^2}$

the disk part

only a z part of $d\vec{a}$

so $\quad (\overleftrightarrow{T} \cdot d\vec{a})_z = T_{zz} \, da_z$

$T_{zz} = \frac{\epsilon_o}{2}\left(\cancel{E_z^2} - E_x^2 - E_y^2 \right)$

$\leftarrow$ with $\theta = 90°$

$E_x = s\cos\phi \frac{Q}{4\pi\epsilon_o s^2} \quad \frac{Q\cos\phi}{4\pi\epsilon_o s^3}$

$E \, 4\pi s^2 = \frac{Q s^3}{\epsilon R^3} \implies E = \frac{Q s}{4\pi\epsilon_o R^3}$

$-E_x^2 - E_y^2 = \frac{Q s}{4\pi\epsilon_o R^3}$

$T_{zz} = -\frac{\epsilon_o}{2}\left(\frac{Q s}{4\pi\epsilon_o R^3} \right)^2$

so $\quad (\overleftrightarrow{T} \cdot d\vec{a})_z = \frac{\epsilon_o}{2}\left(\frac{Q}{4\pi\epsilon_o R^3} \right)^2 \cdot s^2 \cdot s \, d\phi \, ds$

$F_{disk} = \int_{disk} (\overleftrightarrow{T} \cdot d\vec{a})_z = \frac{Q^2}{(4\pi\epsilon_o R^3)^2} \int_0^R s^3 \, ds \to \int_0^{2\pi} d\phi$

$= \frac{1}{4\pi\epsilon_o} \frac{Q^2}{16 R^2}$

so $\quad |F_{net}| = |(F_{net})_z| = F_{disk} + F_{bowl} = \frac{1}{4\pi\epsilon_o} \frac{3Q^2}{16R^2}$

Alternatively $\quad \vec{F} = \int d\vec{F} = \int E \, dq = \int_V \vec{E} \rho \, d\tau$

$E = \frac{Q s}{4\pi\epsilon_o R^3} \hat{s} \quad\quad E_z = \frac{Q s \cos\theta}{4\pi\epsilon_o R^3}$

$d\tau = s^2 \sin\theta \, ds \, d\theta \, d\phi$

do this for extra credit