

22. We find the maximum by differentiating Eq. 23-16 and setting the result equal to zero.

$$\frac{d}{dz} \left( \frac{qz}{4\pi\epsilon_0 (z^2 + R^2)^{3/2}} \right) = \frac{q}{4\pi\epsilon_0} \frac{R^2 - 2z^2}{(z^2 + R^2)^{5/2}} = 0$$

which leads to  $z = R/\sqrt{2}$ .