

18. We use Eq. 23-3, assuming both charges are positive.

$$\begin{aligned} E_{\text{left ring}} &= E_{\text{right ring}} \quad \text{evaluated at } P \\ \frac{q_1 R}{4\pi\epsilon_0 (R^2 + R^2)^{3/2}} &= \frac{q_2 (2R)}{4\pi\epsilon_0 ((2R)^2 + R^2)^{3/2}} \end{aligned}$$

Simplifying, we obtain

$$\frac{q_1}{q_2} = 2 \left( \frac{2}{5} \right)^{3/2} \approx 0.51 .$$