13. The magnitude of the force of either of the charges on the other is given by

$$F = \frac{1}{4\pi\varepsilon_0}\frac{q(Q-q)}{r^2}$$

where r is the distance between the charges. We want the value of q that maximizes the function $f(q) = q(Q-q)$. Setting the derivative df/dq equal to zero leads to $Q - 2q = 0$, or $q = Q/2$.