

63. On the one hand, the conclusion (that $Q = +1.0\mu\text{C}$) is clear from symmetry. If a more in-depth justification is desired, one should use Eq. 23-3 for the electric field magnitudes of the three charges (each at the same distance $r = a/\sqrt{3}$ from C) and then find field components along suitably chosen axes, requiring each component-sum to be zero. If the y axis is vertical, then (assuming $Q > 0$) the component-sum along that axis leads to $2kq \sin 30^\circ / r^2 = kQ / r^2$ where q refers to either of the charges at the bottom corners. This yields $Q = 2q \sin 30^\circ = q$ and thus to the conclusion mentioned above.