

PROB. OF CHAP. 16: Electric Force and Field

16.1. We study three point charges at the corners of a triangle, as shown in Fig. 16.21. Their charges are $q_1 = +5.0 \times 10^{-9}$ C, $q_2 = -4.0 \times 10^{-9}$ C, and $q_3 = +2.5 \times 10^{-9}$ C. Two distances of separation are also given, $l_{12} = 4$ m and $l_{13} = 6$ m. Find the net electric force on q_3 .

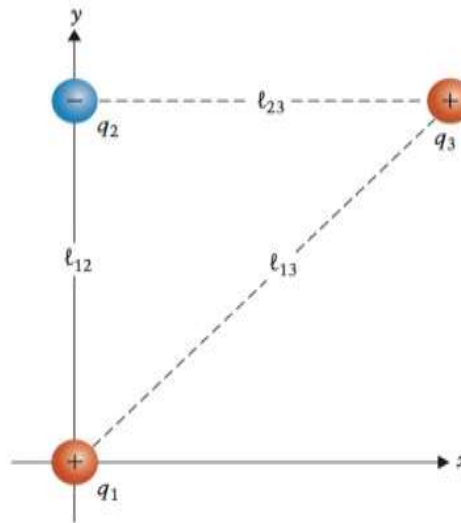


Figure 16.21

16.11. Calculate the electric field halfway between two point charges, one carrying $+10.0 \times 10^{-9}$ C and the other (a) $+5.0 \times 10^{-9}$ C at a distance of 20 cm, and (b) -5.0×10^{-9} C at a distance of 20 cm.

16.13. An electron is released into a uniform electric field of magnitude 1.5×10^3 N/C. Calculate the acceleration of the electron, neglecting gravity.

16.17. In a hydrogen atom, what are the magnitude and the direction of the electric field due to the proton at the location of the electron, which we assume is 5.0×10^{-11} m away from the proton?

16.24. Point charges $q_1 = +5 \mu\text{C}$ and $q_2 = -20 \mu\text{C}$ are fixed in place and separated by a distance $L = 1.5$ m. At what point or points along the line that passes through both point charges will the electric field be zero?