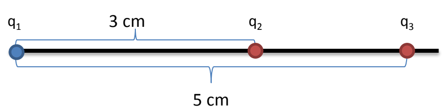
The Superposition Principle Math Help

$$F = K\frac{q_A q_B}{r^2}$$

There are 3 point charges that lie along the x-axis of a line. They are at x = 0m (q_1), x = 3 cm (q_2), and x = 5 cm (q_3). Find the magnitude of the resulting force on q_3.

$$F = K\frac{q_A q_B}{r^2}$$

$q_1 = 6 \times 10^{-9}$ C **$q_2 = 1.5 \times 10^{-9}$ C** **$q_3 = -2 \times 10^{-9}$ C**

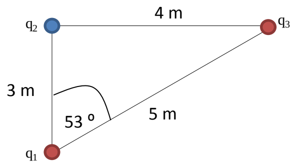


Givens:
$r_{1,2}$ = 0.03 m
$r_{1,3}$ = 0.05 m
$r_{3,2}$ = 0.02 m
$q_1 = 6 \times 10^{-9}$ C
$q_2 = 1.5 \times 10^{-9}$ C
$q_3 = -2 \times 10^{-9}$ C
$K_C = 8.99 \times 10^9$ N*m²/C²
$F_{3, total}$ = _______________

There are 3 charges at the corners of a triangle. Find the magnitude of the resulting force on q_3. (See diagram below)

$$F = K\frac{q_A q_B}{r^2}$$

$q_1 = 6 \times 10^{-9}$ C **$q_2 = -2 \times 10^{-9}$ C** **$q_3 = 5 \times 10^{-9}$ C**

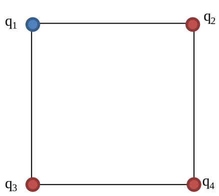


Givens:
$r_{1,2}$ = 3 meters
$r_{1,3}$ = 5 meters
$r_{3,2}$ = 4 meters
$q_1 = 6 \times 10^{-9}$ C
$q_2 = -2 \times 10^{-9}$ C
$q_3 = 5 \times 10^{-9}$ C
$K_C = 8.99 \times 10^9$ N*m²/C²
$F_{3,\,total}$ = _______________

There are 4 point charges that lie at the corners of a 15 cm square. (See diagram) Find the magnitude of the resulting force on q_1.

$$F = K\frac{q_A q_B}{r^2}$$

$q_1 = 3 \times 10^{-6}$ C **$q_2 = -6 \times 10^{-6}$ C** **$q_3 = -2.4 \times 10^{-6}$ C** **$q_4 = -9 \times 10^{-6}$ C**



Givens:
$r_{1,2}$ = 0.15 meters
$r_{1,3}$ = 0.15 meters
$r_{1,4}$ = 0.21 meters
$q_1 = 3 \times 10^{-6}$ C
$q_2 = -6 \times 10^{-6}$ C
$q_3 = -2.4 \times 10^{-6}$ C
$q_4 = -9 \times 10^{-6}$ C
$K_C = 8.99 \times 10^9$ N*m²/C²
$F_{1,\,total}$ = _______________