

Solutions

Each answer shows the steps, then the **result**.

2.1

- $F = k \frac{q_1 q_2}{r^2} = 8.99 \times 10^9 \times \frac{(2.0 \times 10^{-6})^2}{(0.30)^2} = 0.40 \text{ N}$

2.2

- the electrostatic force (by far)

2.3

- $N = \frac{8.0 \times 10^{-19}}{1.6 \times 10^{-19}} = 5$

3.1 C

3.2 B

3.3

(a)

- $F = 8.99 \times 10^9 \times \frac{(3.0 \times 10^{-6})(1.0 \times 10^{-6})}{(0.10)^2} = 2.7 \text{ N}$

(b)

- zero — the two outer charges push the middle charge with equal forces in opposite directions, which cancel