

① REMOVE
 $e^- = 1.6 \times 10^{-19} \text{ C}$

↓
 $+ 2.4 \times 10^{-6} \text{ C}$

$$\frac{2.4 \times 10^{-6} \text{ C}}{1.6 \times 10^{-19} \text{ C}} = 1.5 \times 10^{13} e^-$$

$$\begin{aligned} \textcircled{2} \quad & -2.0 \times 10^{-6} \\ & \downarrow \\ & \text{REMOVE } e^- \\ & e^- = 1.6 \times 10^{-19} \text{ C} \\ & \downarrow \\ & +3.0 \times 10^{-6} \text{ C} \end{aligned}$$

$$\text{TOTAL CHANGE} = 5.0 \times 10^{-6} \text{ C}$$

$$\frac{5.0 \times 10^{-6} \text{ C}}{1.6 \times 10^{-19} \text{ C}} = 3.125 \times 10^{13} e^-$$

③

$$+8.0 \times 10^{-6} \text{ C}$$

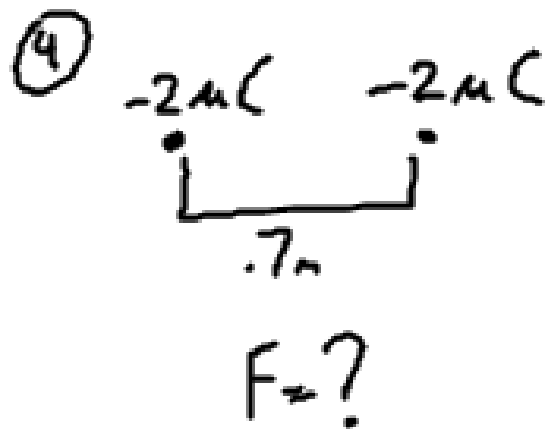
↓

$$\text{ADD } 6.0 \times 10^{13} e^- \\ e^- = 1.6 \times 10^{-19} \text{ C}$$

$$6.0 \times 10^{13} e^- * 1.6 \times 10^{-19} \text{ C} =$$

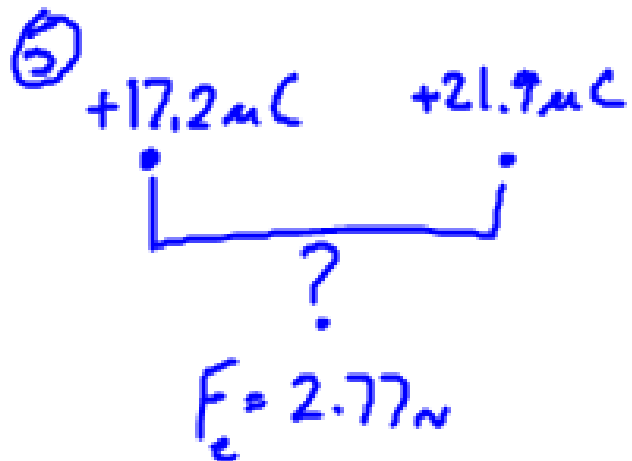
$$+8.0 \times 10^{-6} \text{ C} + (-9.6 \times 10^{-6} \text{ C}) \\ = -1.6 \times 10^{-6} \text{ C}$$

9.6×10^{-6}
OF
NEGATIVE
CHARGE



$$F_c = \frac{k q^2}{r^2}$$
$$= \frac{9 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2} (2 \times 10^{-6} \text{C})^2}{.7\text{m}^2}$$
$$= .073 \text{ N}$$

BOTH CHARGES
NEGATIVE
LIKE
REPELS

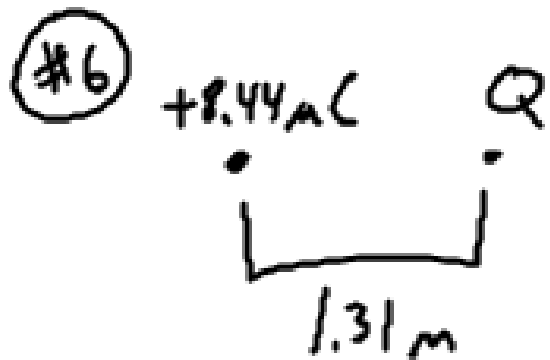


$$F_e = k \frac{q_A q_B}{r^2}$$

$$r = \sqrt{\frac{k q_A q_B}{F_e}}$$

$$= \sqrt{\frac{9 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2} (17.2 \times 10^{-6} \text{ C}) (21.9 \times 10^{-6} \text{ C})}{2.77}}$$

$$= 1.1 \text{ m}$$



$$F = .975 \text{ N}$$

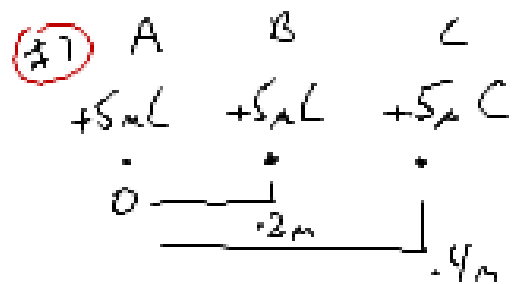
$$Q = ?$$

$$F_c = \frac{K q_1 q_2}{r^2}$$

$$q_2 = \frac{F_c r^2}{K q_1}$$

$$= \frac{.975 \text{ N} (1.31 \text{ m}^2)}{9 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2} (8.44 \times 10^{-6} \text{ C})}$$

$$= 2.2 \times 10^{-5} \text{ C} = 22.0 \mu\text{C}$$



F_e on C

Two forces

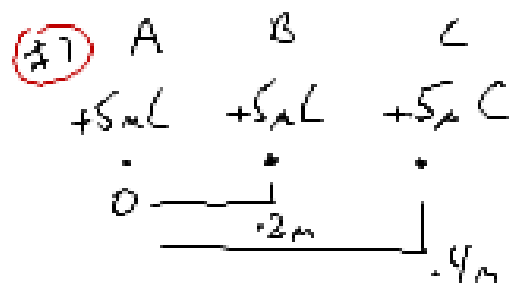
$$F_{AC} + F_{BC}$$

$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +

ADD → 7.0



F_e on C

Two FORCES

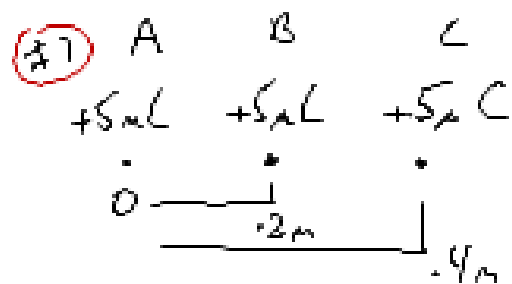
$$F_{AC} + F_{BC}$$

$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +

ADD → 7.0



F_e on C

Two FORCES

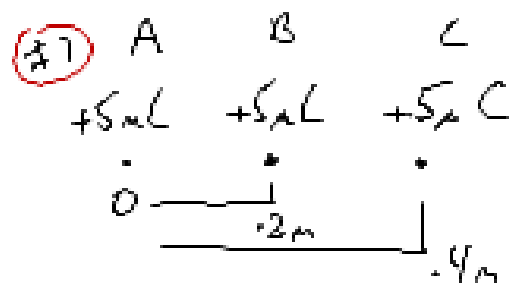
$$F_{AC} + F_{BC}$$

$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +

→ ADD → 7.0



F_e on C

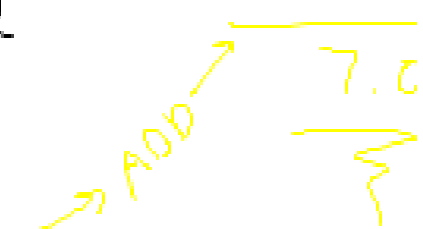
Two FORCES

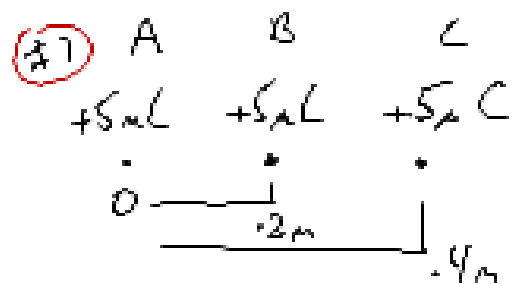
$$F_{AC} + F_{BC}$$

$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +





F_e on C

Two FORCES

$$F_{AC} + F_{BC}$$

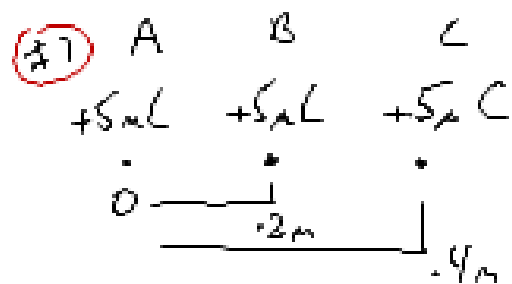
$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +

→ ADD →

7.0



F_e on C

Two FORCES

$$F_{AC} + F_{BC}$$

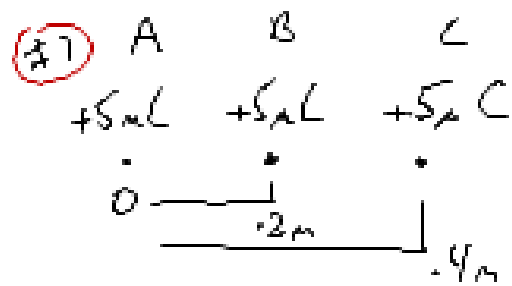
$$F_{AC} = \frac{k q_A q_C}{r_{AC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.4^2} = 1.4$$

$$F_{BC} = \frac{k q_B q_C}{r_{BC}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AC} IS TO THE RIGHT = +
 F_{BC} IS TO THE RIGHT = +

ADD →

$$\begin{array}{r} 1.4 \\ + 5.6 \\ \hline 7.0 \end{array}$$



F_e on B

Two FORCES

$$F_{AB} + F_{CB}$$

$$F_{AB} = \frac{k q_A q_B}{r_{AB}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

$$F_{CB} = \frac{k q_C q_B}{r_{CB}^2} = \frac{9 \times 10^9 (5 \times 10^{-6})(5 \times 10^{-6})}{.2^2} = 5.6$$

F_{AB} IS TO THE RIGHT = + \rightarrow ADD

F_{CB} IS TO THE LEFT = -

0