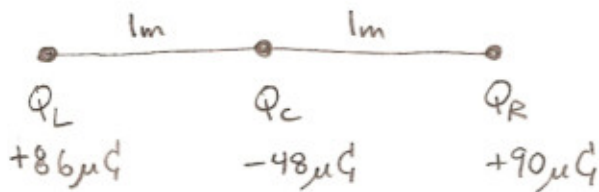


9.



$$\vec{F}_{\text{Ton}Q_R} = ?$$

$$\vec{F}_{\text{Ton}Q_R} = \vec{F}_{LR} + \vec{F}_{CR}$$

$$F_{LR} = k \frac{(+86 \mu\text{C})(+90 \mu\text{C})}{(1\text{m})^2}$$

pos  $\Rightarrow$  repulsive  
so  $F_{LR}$  on  $Q_R$  points to the right.

$$F_{CR} = k \frac{(-48 \mu\text{C})(+90 \mu\text{C})}{(1\text{m})^2}$$

neg  $\Rightarrow$  attractive  
so  $F_{CR}$  on  $Q_R$  points to the left.

Now let Right be  $\oplus$  direction  
and Left be  $\ominus$  direction, so

$$F_{\text{Ton}Q_R} = +k \frac{(86 \mu\text{C})(90 \mu\text{C})}{(1\text{m})^2} - k \frac{(48 \mu\text{C})(90 \mu\text{C})}{(1\text{m})^2}$$

$$k = 9 \times 10^9 \frac{\text{Nm}^2}{\text{C}^2}$$

$$F_{\text{Ton}Q_R} = \frac{9 \times 10^9 \frac{\text{Nm}^2}{\text{C}^2}}{1\text{m}^2} \left[ 7740 - 4320 \right] \times 10^{-12} \frac{\text{C}^2}{\text{C}^2}$$

$$F_{\text{Ton}Q_R} = 30.78 \text{ N toward the right}$$

Not listed.