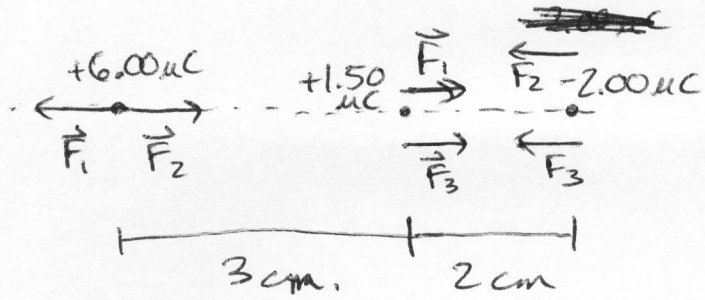
10.



$$F_1 = \frac{k_e q_1 q_2}{r_{12}^2} = \frac{k_e (6.00\times10^{-6}\,C)(1.50\times10^{-6}\,C)}{(3.00\times10^{-2}\,m)^2}$$

$$= 89.9\ N$$

$$F_2 = \frac{k_e q_1 |q_3|}{r_{13}^2} = \frac{k_e (6.00\times10^{-6}\,C)(2.00\times10^{-6}\,C)}{(5.00\times10^{-2}\,m)^2}$$

$$= 43.2\ N$$

$$F_3 = \frac{k_e q_2 |q_3|}{r_{23}^2} = \frac{k_e (1.50\times10^{-6}\,C)(2.00\times10^{-6}\,C)}{(2.00\times10^{-2}\,m)^2}$$

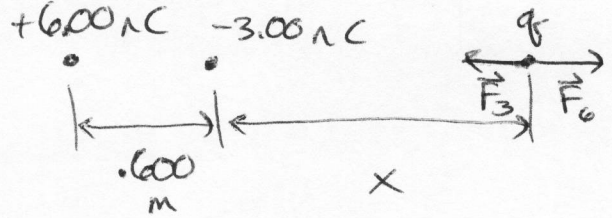
$$= 67.4\ N$$

F_{NET} on 6μC charge : $F_6 = F_1 - F_2 = 46.7\ N$ (to the left)

F_{NET} on 1.5 μC charge : $F_{1.5} = F_1 + F_3 = 157\ N$ (to the right)

F_{NET} on −2 μC charge : $F_{-2} = F_2 + F_3 = 111\ N$ (to the left)

16.



$F_6 = F_3$

$$\frac{k_e(6.00\,nC)q}{(x+0.600\,m)^2} = \frac{k_e(3.00\,nC)q}{x^2} \Rightarrow 2x^2 = (x+0.600\,m)^2$$

$$\Rightarrow x = \frac{0.600\,m}{\sqrt{2}-1} = 1.45\,m \text{ beyond the } -3.00\,nC \text{ charge}$$

35. For uniformly charged sphere, the field is strongest at the surface.

$$\Rightarrow E_{max} = \frac{k_e q_{max}}{R^2}$$

$$q_{max} = \frac{R^2 E_{max}}{k_e} = \frac{(2.0\,m)^2(3.0\times10^6\,N/C)}{8.99\times10^9\,N\cdot m^2/C^2}$$

$$= \boxed{1.3\times10^{-3}\,C}$$

55. $\Phi_E = EA\cos\theta$

$= (2.0\times10^4\ N/C)[(6.00m)(3.00m)]\cos(10.0°)$

$= \boxed{3.55\times10^5\ N\cdot m^2/C}$