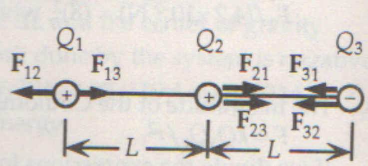
10. The number of molecules in 1.0 kg is
$N = [(1.0 \text{ kg})(10^3 \text{ g/kg})/(18 \text{ g/mol})](6.02 \times 10^{23} \text{ molecules/mol}) = 3.34 \times 10^{25}$ molecules.
Each molecule of H_2O contains 2(1) + 8 = 10 electrons. The charge of the electrons in 1.0 kg is
$q = (3.34 \times 10^{25} \text{ molecules})(10 \text{ electrons/molecule})(-1.60 \times 10^{-19} \text{ C/electron})$
$= \boxed{-5.4 \times 10^7 \text{ C.}}$

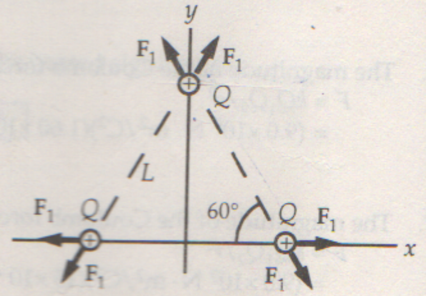
11. Using the symbols in the figure, we find the magnitudes of the three individual forces:



$F_{12} = F_{21} = kQ_1Q_2/r_{12}^2 = kQ_1Q_2/L^2$
$= (9.0 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2)(70 \times 10^{-6} \text{ C})(48 \times 10^{-6} \text{ C})/(0.35 \text{ m})^2$
$= 2.47 \times 10^2$ N.
$F_{13} = F_{31} = kQ_1Q_3/r_{12}^2 = kQ_1Q_3/(2L)^2$
$= (9.0 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2)(70 \times 10^{-6} \text{ C})(80 \times 10^{-6} \text{ C})/[2(0.35 \text{ m})]^2$
$= 1.03 \times 10^2$ N.
$F_{23} = F_{32} = kQ_2Q_3/r_{12}^2 = kQ_2Q_3/L^2$
$= (9.0 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2)(48 \times 10^{-6} \text{ C})(80 \times 10^{-6} \text{ C})/(0.35 \text{ m})^2$
$= 2.82 \times 10^2$ N.

The directions of the forces are determined from the signs of the charges and are indicated on the diagram. For the net forces, we get
$F_1 = F_{13} - F_{12} = 1.03 \times 10^2 \text{ N} - 2.47 \times 10^2 \text{ N} = \boxed{-1.4 \times 10^2 \text{ N (left).}}$
$F_2 = F_{21} - F_{23} = 2.47 \times 10^2 \text{ N} + 2.82 \times 10^2 \text{ N} = \boxed{+5.3 \times 10^2 \text{ N (right).}}$
$F_3 = -F_{31} - F_{32} = -1.03 \times 10^2 \text{ N} - 2.82 \times 10^2 \text{ N} = \boxed{-3.9 \times 10^2 \text{ N (left).}}$
Note that the sum for the three charges is zero.

12. Because all the charges and their separations are equal, we find the magnitude of the individual forces:



$F_1 = kQQ/L^2 = kQ^2/L^2$
$= (9.0 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2)(11.0 \times 10^{-6} \text{ C})^2/(0.150 \text{ m})^2$
$= 48.4$ N.
The directions of the forces are determined from the signs of the charges and are indicated on the diagram.
For the forces on the top charge, we see that the horizontal components will cancel. For the net force, we have
$F = F_1 \cos 30° + F_1 \cos 30° = 2F_1 \cos 30°$
$= 2(48.4 \text{ N}) \cos 30°$
$= 83.8$ N up, or away from the center of the triangle.
From the symmetry each of the other forces will have the same magnitude and a direction away from the center: The net force on each charge is $\boxed{\text{83.8 N away from the center of the triangle.}}$
Note that the sum for the three charges is zero.