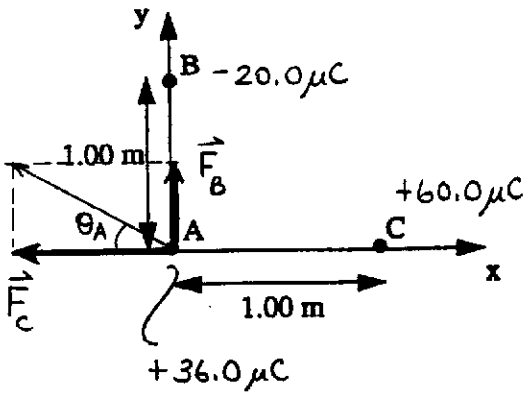
C2. Three particles, A, B and C, are taken into space. Particle A has mass 1.00×10^{-5} kg and a charge of +36.0 μC, particle B has a charge of −20.0 μC and particle C has charge +60.0 μC. The particles are arranged as shown in the diagram. Particles B and C are held fixed while particle A is released. Determine the initial acceleration of particle A. (Specify the direction by the angle from the positive x-axis.)

magnitude	direction
	162°



$$\Sigma F_x = -F_C$$

$$F_C = \frac{k|q_A q_C|}{r_{AC}^2}$$

$$F_C = \frac{(9.00\times10^9\ N\cdot m^2/C^2)(36.0\times10^{-6}\ C)(60.0\times10^{-6}\ C)}{(1.00\ m)^2} = 19.4\ N$$

similarly, $F_B = 6.48\ N$ and $\Sigma F_y = F_B$

From Newton II:

$$|\vec{a}_A| = \frac{|\Sigma \vec{F}|}{m_A} = \frac{\sqrt{(\Sigma F_x)^2 + (\Sigma F_y)^2}}{m_A} = \frac{\sqrt{(-19.4\ N)^2 + (6.48\ N)^2}}{1.00\times10^{-5}\ kg}$$

$$a_A = 2.05\times10^6\ m/s^2$$

$$\tan\theta_A = \frac{|F_B|}{|F_C|} \Rightarrow \theta_A = \arctan\left(\frac{|F_B|}{|F_C|}\right) = \arctan\left(\frac{6.48\ N}{19.4\ N}\right)$$

$$\theta_A = 18.5°$$

∴ angle with +x-axis is $180° - 18.5° = 162°$