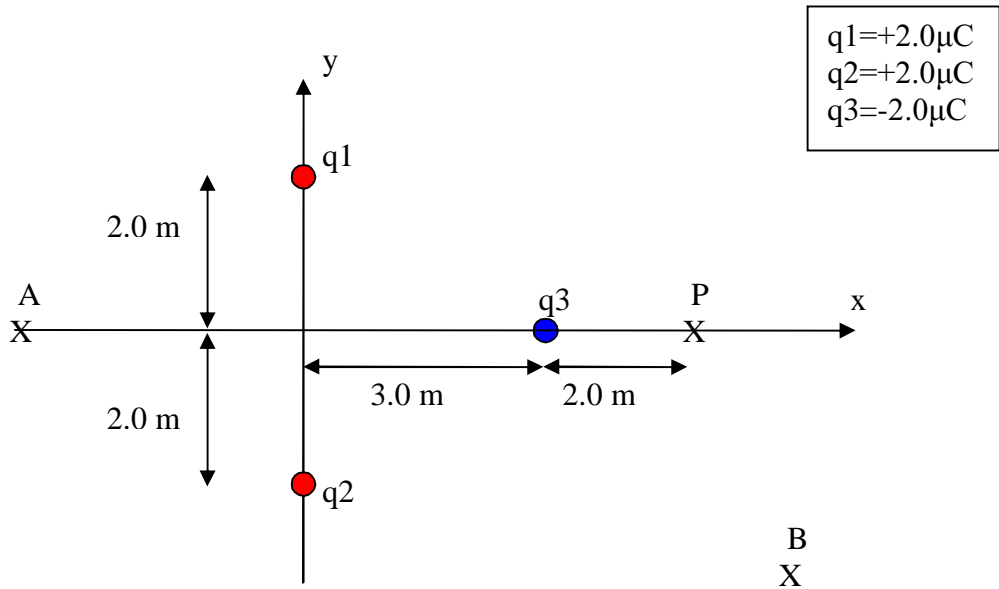


$$\mu=10^{-6} \quad n=10^{-9} \quad \epsilon_0=8.85 \times 10^{-12} \text{ NC}^{-2}\text{m}^2$$

Quiz for January 19 2005 - Physics 151-001 - Prof. Thomson

- (1) Three point charges are arranged in the xy plane as shown below. Charge q_3 , located on the x -axis 3.0m to the right of the origin, is negative. The other two charges, located on the y -axis 2.0m above and below the origin, are positive. All three stationary charges have an equal magnitude of $2.0 \mu\text{C}$.



(3 pts)

- (a) Indicate (*on the diagram above*) the direction of the electric field from each stationary charge at point P.
- (b) Find the two components of the electric field in the xy plane at point P, which is located 5.0m to the right of the origin and 2.0m to the right of q_3 on the x -axis.
- i. $E_x = ?$
 - ii. $E_y = ?$

(5 pts)

Continued overleaf

(1 pt)

(c) Calculate the magnitude of the force on a test charge of $1.0\mu\text{C}$ placed at point P.

(1 pt)

(d) Considering only the three stationary charges, at how many points in the xy plane is the total electric field zero? Do not include points at infinity. (Hint: Do not try to solve this analytically! Try drawing the direction of the electric field from each stationary charge at several points, for example at point A and at point B.)