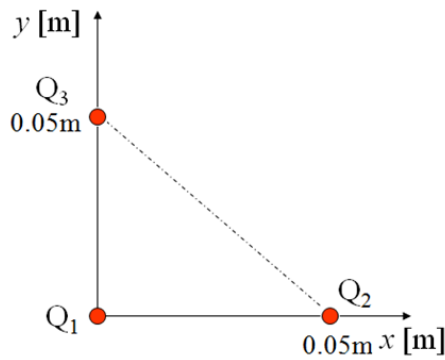




Sheet 04

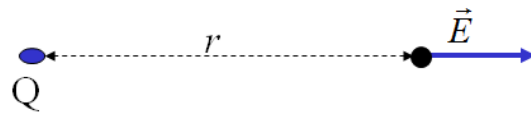
- 1] A 2 mC positive charge is located in vacuum at $P_1(3, -2, -4)$ and a $5\mu\text{C}$ negative charge is at $P_2(1, -4, 2)$:
- Find the vector force on the negative charge.
 - What is the magnitude of the force on the charge at P_1 ?
-
- 2] Find the force on a $100\mu\text{C}$ charge at $(0,0,3)\text{m}$ if four like charges of $20\mu\text{C}$ are located on the x and y axes at $\pm 4\text{m}$.
-
- 3] Two point charges, $Q_1=50\mu\text{C}$ and $Q_2=10\mu\text{C}$ are located at $(-1,1, -3)\text{m}$ and $(3,1,0)\text{m}$, respectively. Find the force on Q_1 .
-
- 4] Point charge $Q_1=300\mu\text{C}$, located at $(1, -1, -3)\text{m}$, exerts a force $F_1= 8a_x - 8a_y + 4a_z\text{N}$ due to point charge Q_2 located at $(3, -3, -2)\text{m}$. Determine Q_2 .
-
- 5] The force on a point charge, Q_1 situated 10 cm away from another point charge Q_2 of the same magnitude in a dielectric medium of relative permittivity, $\epsilon_r= 81$ is $\vec{F} = 0.1\text{N}$. Determine the magnitude of the charge.
-
- 6] Three point charges $Q_1 = -1\mu\text{C}$, $Q_2 = -2\mu\text{C}$ and $Q_3 = 2\mu\text{C}$ are located in air at the corners of a right angle triangle with the two sides of right angle are equal to 5 cm as shown in Fig. 1. Determine the magnitude and direction of the force on Q_3 .
-



7

(a) If the electric field intensity \vec{E} as shown in Fig. 2 is 100V m^{-1} at a distance of $r = 2\text{ m}$ from a point charge Q , find Q if $\epsilon_r = 1$.

(b) Is \vec{E} radially in or outward?



8 Three equal point charges, $Q_1 = Q_2 = Q_3 = 3\text{ nC}$, are placed at each of the three corners of a square whose side is 0.2 m as shown in Fig. 3. Find the magnitude and direction of the electric field at the vacant corner point of the square.

