

Name: _____ Section: _____ Score: _____/20

1. As shown in Figure 1 several point charges are fixed in space, making an electric field \mathbf{E} in a plane. At the origin O the electric field is given by $\mathbf{E} = (2.3, -0.8) \times 10^3 \text{ N/C}$.

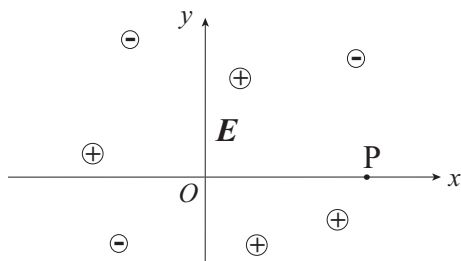


Figure 1:

(a) A charge $q = -1.3 \mu\text{C}$ is placed at the origin. What is the magnitude of the force acting on this charge q ? [5]

(b) Now, the charge q in (a) is moved to location P whose coordinate vector is given by $(1.2, 0) \text{ m}$. What is the electric field at the origin due to all the charges? [5]

2. Electric field lines due to 6 charges A - F (and other charges outside the figure window) on a plane are depicted in Fig. 2.

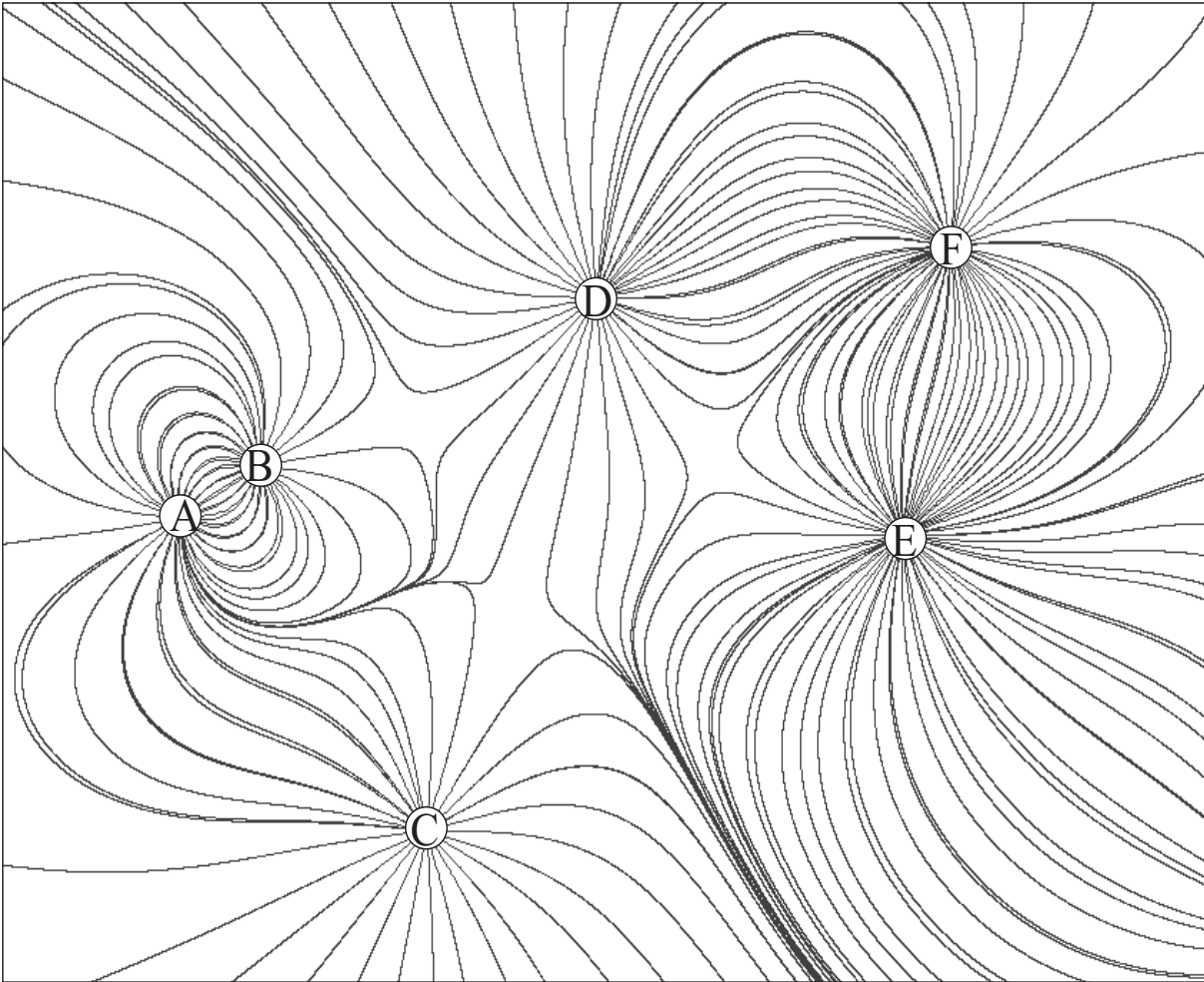


Figure 2:

- (a) Suppose charge A is negative. Tell all the other negative charges. [4]
- (b) There are locations where the electric field is zero. Mark all such points in the figure with X. [3]
- (c) Suppose only charge B is allowed to move. Draw an arrow that indicates the initial direction of its motion. [3]