EEE 23
DC 1-3: Electric Fields II

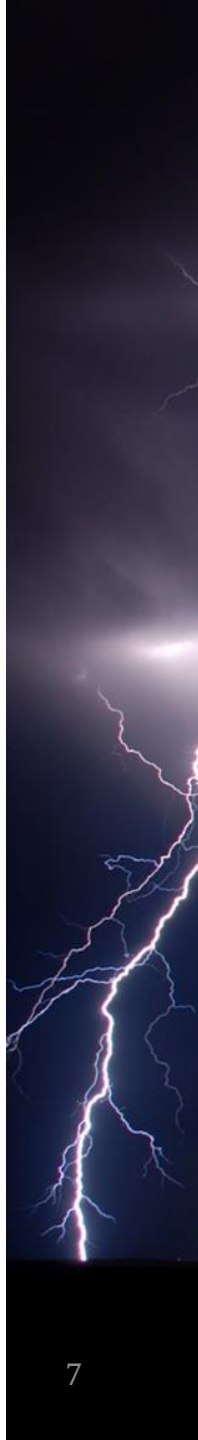
Continuous Charge Distributions
Streamlines

Problem 3 Streamlines

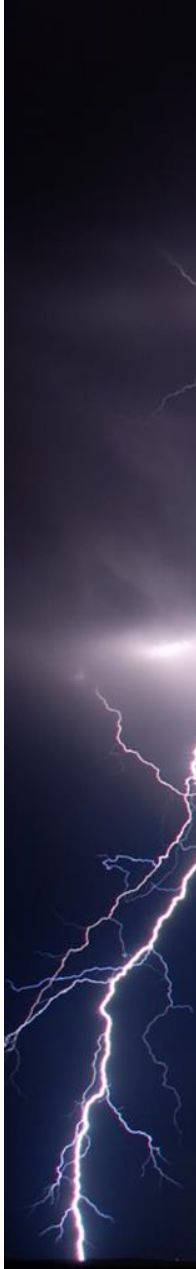
Given the field $\mathbf{E} = 15x^2 y\,\mathbf{a}_x + 5x^3\mathbf{a}_y$, find:

a. the equation of the streamline that passes through P(2,3,-4);

b. a unit vector $\mathbf{a}_E$ specifying the direction of $\mathbf{E}$ at P.



SOLUTIONS



Problem 2
Flat Circular Disk of Charge

4 Find the distance from Q to P*

$$r = \sqrt{\rho^2 + z^2}$$

5 Find the unit vector from Q to P*

$$\vec{r} = \frac{\langle -\rho\cos\varphi, -\rho\sin\varphi, z\rangle_{xyz}}{\sqrt{\rho^2 + z^2}}$$