

Problem Set #2
Due at 4pm Friday, September 23, 2005

1. Potential and Electric Field with Cylindrical Symmetry

- a) Find the electrostatic potential $V(z)$ a distance z above the center of a circular loop of radius s , which carries a uniform linear charge density λ . Do not assume $z > 0$.
- b) Find the electrostatic potential a distance z above the center of a circular disk of radius R , which carries a uniform surface charge density σ .
- c) Using the potential and symmetry, determine the electric field a distance z above the center of the circular disk. What does your formula give in the limits $z^2 \ll R^2$ and $z^2 \gg R^2$?

2. Gauss's law and linear superposition

- a) **Griffiths** Problem 2.12 (p. 75)
- b) **Griffiths** Problem 2.18 (p. 75)

3. Griffiths Problem 2.49 (twice the credit of one problem) (p. 108)