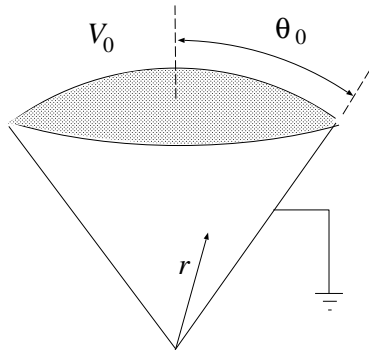**Homework**

A closed surface consists of a cone topped by a segment of a spherical suface, centered on the apex of the cone. The opening angle of the cone is denoted θ_0.

The conical sides are grounded, i.e., are at electrical potential zero. The spherical cap is at some nonzero potential V_0. Inside the closed surface, the interior electric field intensity vanishes at the apex (if $\theta_0 < \pi/2$). At a distance r from the apex the electric field strength has a magnitude that behaves as

$$E \propto r^k .$$

Write a program that solves for k, given a certain value of θ_0. Your program should have MANY MANY comments so that I can figure out what you are doing.

Submit the following, by email, before 5pm, Tuesday, February 18:

• The C++ code for your program.

• A paragraph explaining how to use your program, and containing, as a special case, the value of k for $\theta_0 = \pi/4$.

• A graph (pdf, png, jpeg,...) of k vs θ_0 based on at least 4 computations with your program.