

16.1: Introduction

This chapter covers some the more detailed calculations of electric quantities for various distributions of charge:

- Section 2 provides results related to the electric dipole.
- Section 3 describes how to calculate the electric field for a variety of continuous charge distributions using a method of direct integration.
- Section 4 describes how to calculate the electric potential for a variety of continuous charge distributions using a method of direct integration.

The method of direct integration can be applied to any distribution of charge but the integrals can only sometimes be evaluated analytically to give a function. If they cannot be calculated analytically, then they have to be evaluated numerically. Methods for numerical integration are beyond the scope of this text.

In some cases of high symmetry, it can be easier to calculate the electric field of some continuous distributions using Gauss's Law. This approach, when it can be used, can be quite elegant. This approach is the subject of the subsequent chapter [Gauss's Law for Calculation of Electrical Field from Charge Distributions](#).

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