

In The Name Of God

Assignment number 2 of Electromagnetics 1

Spring 2020

1. Please answer the following questions from “Introduction to Electrodynamics” by D.J.Griffiths (forth edition) :

- 2.7
- 2.18

2.

*Force from a cone ***

- (a) A charge q is located at the tip of a hollow cone (such as an ice cream cone without the ice cream) with surface charge density σ . The slant height of the cone is L , and the half-angle at the vertex is θ . What can you say about the force on the charge q due to the cone?
- (b) If the top half of the cone is removed and thrown away (see Fig. 1.31), what is the force on the charge q due to the remaining part of the cone? For what angle θ is this force maximum?

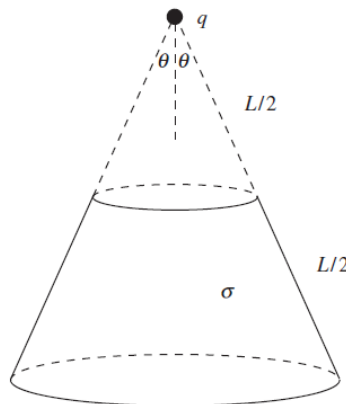


Figure 1.31.

3.

N charges on a circle ***

N point charges, each with charge Q/N , are evenly distributed around a circle of radius R . What is the electric field at the location of one of the charges, due to all the others? (You can leave your answer in the form of a sum.) In the $N \rightarrow \infty$ limit, is the field infinite or finite? In the $N \rightarrow \infty$ limit, is the force on one of the charges infinite or finite?