GP2-LQA2 學號:_____ 系級:_____姓名: _____ 得分:_____

力 萬 求
行 信 真

填充,計算題須寫出計算過程,並且將答案填入空格。

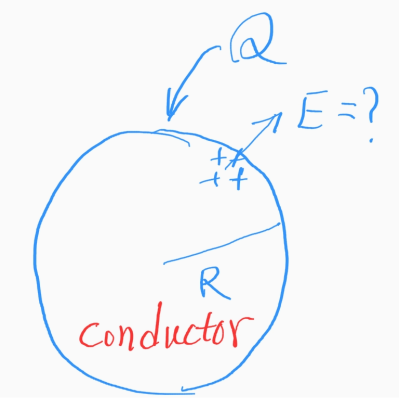
Problem 1

Answer the following questions: (04小題) 01 (a) The figure shows a closed hemisphere surface of radius $R = 3.5$ cm encloses charge $Q = 6.6 \times 10^{-7}$ C. The flux through the rounded portion of the surface is 9.8×10^{4} Nm^2/C. Find the flux through the flat base, Φ=_____ Nm^2/C



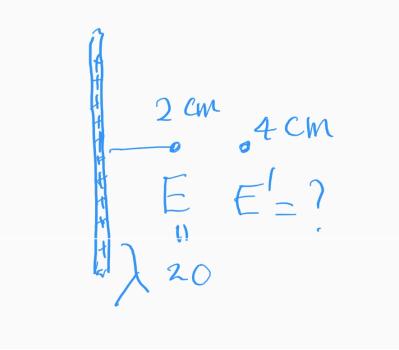
分數= 5 02 (b)

A conducting sphere of radius 0.01 m has a charge of 1.0×10^{-9} C deposited on it. The magnitude of the electric field in N/C just outside the surface of the sphere is: E=_____ N/C



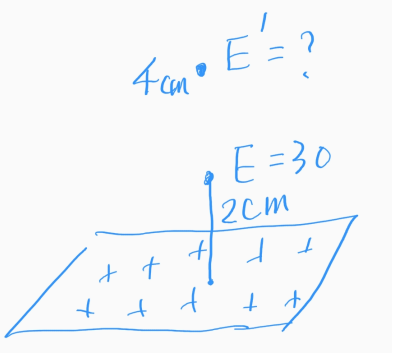
分數= 5 03 (c)

Charge is distributed uniformly along a long straight wire. The electric field 2 cm from the wire is 20 N/C. The electric field 4 cm from the wire is: E =_____ N/C



分數= 5 04 (d)

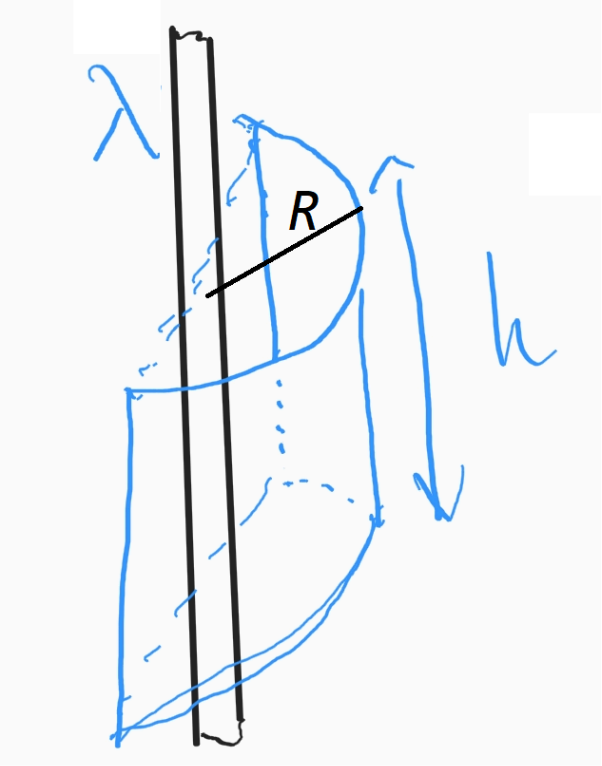
Charge is distributed uniformly on the surface of a large flat plate. The electric field 2 cm from the plate is 30 N/C. The electric field 4 cm from the plate is: E=_____ N/C



分數= 5

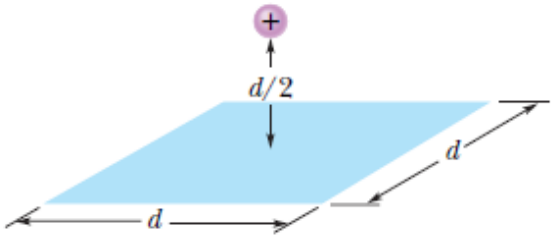
Problem 2

有一個線電荷密度為$\lambda = 2 \times 10^{-8}$ C/m 的帶電直線，通過一個半圓柱體的中心軸，如圖所示。半圓柱體的半徑為$R = 20$ cm，高度為$h = 80$ cm，請計算帶電直線 所生成的電場通過半圓柱體曲面的電通量。 (01小題) 05 電通量，Φ =_____ Nm^2/C 分數= 10



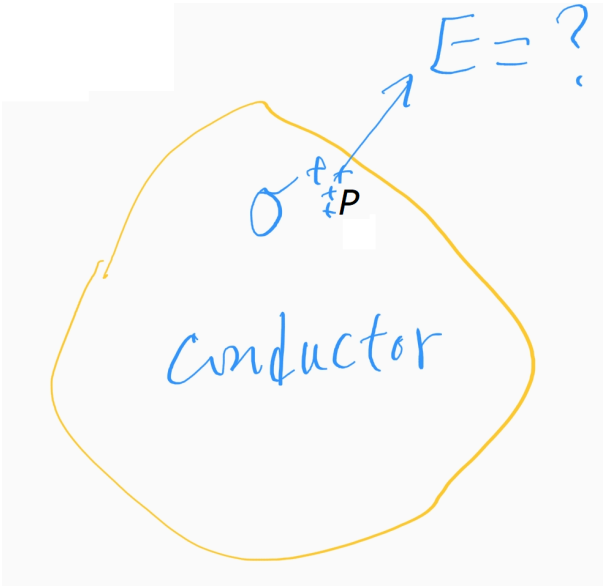
Problem 2

In the figure, a proton is a distance $\frac{d}{2}$ directly above the center of a square of side $d = 10^{-10}$ m. What is the magnitude of the electric flux through the square? (01小題) 06 the magnitude of the electric flux=_____N/C·m^2 分數= 10



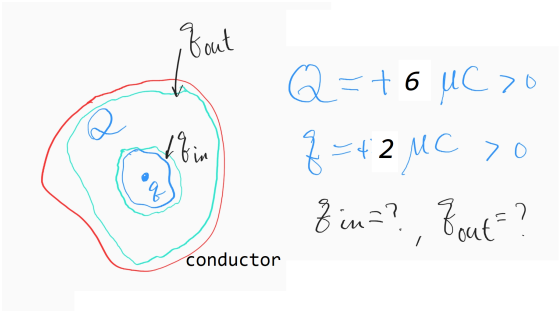
Problem 3

An isolated conductor of arbitrary shape has a surface charge density of $\sigma = 9 \times 10^{-6}$ C/m^2 at the point P on the surface(see figure). What is the electric field strength at P. (01 小題) 07 E=_____ N/C 分數= 5



Problem 3

任意形狀的隔離導體的淨電荷為6×10^{-6} C。導體內部是一個空腔，其內為點電荷$q = 2 \times 10^{-6}$ C。請計算(a)空腔壁上的電荷和(b)導體外表面上的電荷量？ (02小題) 08 (a)空腔壁上的電荷 =_____C 分數= 5 09 (b)導體外表面上的電荷量=_____C 分數= 5



Problem 4

邊長為8.0 cm且厚度可忽略的方形金屬板的總電荷為6×10^{-6} C，假設電荷均勻分佈在板的兩個面上。(a）計算在金>屬板的中心，板表面處的電場強度E。 (b）計算在金屬板的遠方(距離遠大於板的邊長)，該處的電場強度E。以SI為單位。 (02小題) 10 (a) E=_____N/C 分數= 5 11 (b) E =_____N/C 分數= 5

Problem 5

In the figure, a small, nonconducting ball of mass $m = 1$ mg and charge  $q = 2 \times 10^{-8}$ C (distributed uniformly through its volume) hangs from an insulating thread that makes an angle $\theta = 30^{\circ}$ with a vertical, uniformly charged nonconducting sheet (shown in cross section). Considering the gravitational force on the ball and assuming the sheet extends far vertically and into and out of the page, calculate the surface charge density σ of the sheet. (01小題) 12 the surface charge density σ=_____C/m^2 分數= 10

Problem 6

有一個半徑為1.2 m的導體球，將總量Q的電荷傳導到金屬球，測出金屬球的面電荷密度為 12 $\mu C/m^2$ 。計算(a)電荷Q； (b)>球體表面的總電通量。(c)電荷在金屬球的分佈情況。 (03小題) 13 (a)電荷 Q=_____ C 分數= 5 14 (b)總電通量ϕ_E=_____ N/C·m^2 分數= 5 15 (c)1=均勻分佈在整個球體的體積當中。 2=均勻分佈在球體的表面，內部沒有電荷。 3=電荷的分佈密度與距離球心的距離成正比。 4=電荷的分佈密度與距離球心的距離成反比。 請填入1,2,3或4。 ANS=_____ 分數= 5

Problem 7

荷外，該區域沒有其他電場源。(a)若有一球面球心在電荷處且半徑為0.150 m，求通過球面的電通量是多少？(b)點電荷的帶電量？>　　(02小題) 16 (a)電通量=____ $N.m^2/C$ 分數= 5 17 (b)點電荷的帶電量=_____ C 分數= 5