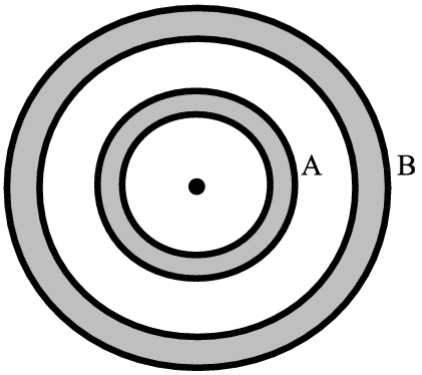
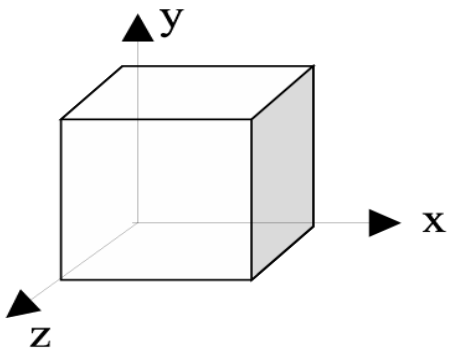
Homework #2

1- A charged particle is held at the center of two concentric conducting spherical shells. A cross section is shown in the figure. If the charged particle at the center has charge +2 μC, and the two conducting shells A and B have charges −3 μC and +4 μC deposited on them, respectively, what is the charge on the inner surface of shell B?.



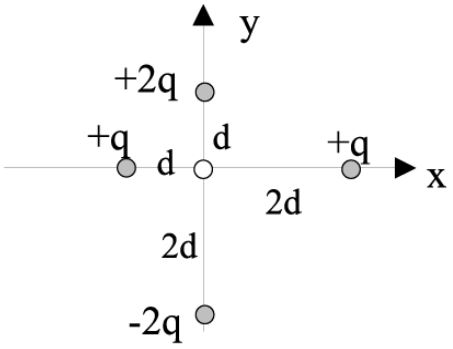
Answer: +1 μC

2- What is the flux through the right side face of the shown cube if the electric field is given by $\underline{E} = -2x\underline{i} + 3y\underline{j}$ and the cube has a side length of 2?



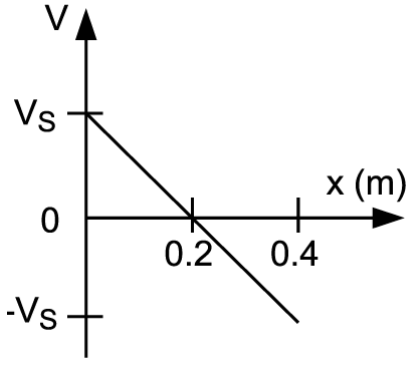
Answer: −16

3- In the figure shown, what is the net electric potential at the origin of the coordinate system due to the four other charged particles if V=0 at infinity? Express your answer in terms of the constants q, d, and k = $1/4\pi\varepsilon_o$.



Answer: 5kq/(2d)

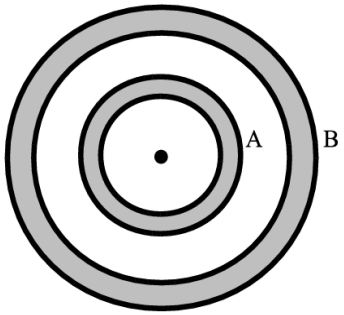
4- The figure shows a graph of the electric potential as a function of x. The scale of the vertical axis is set by V_S = 200 V. What is x component of the force acting on a proton located at x = 0.2 m?



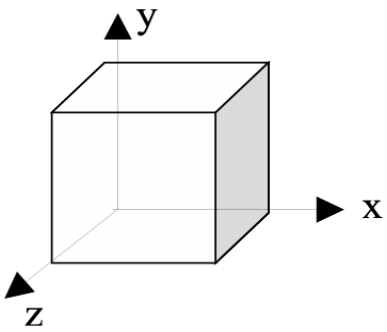
Answer: 1.6 × 10−16 N

Homework #2

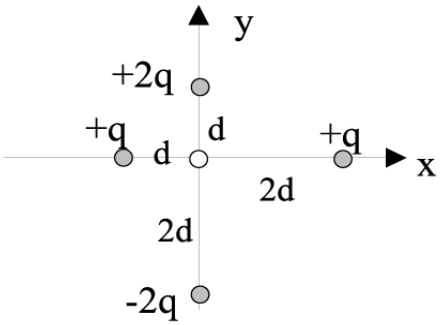
1- جسيم مشحون متمركزة مع قشرتين كرويتين متحدتي المركز. إذا كانت شحنة الجسيم تساوي $+2\ \mu C$ ، والقشرتين الموصلتين A و B شحنتهما $-3\ \mu C$ و $+4\ \mu C$ على التوالي ، ما هي الشحنة على السطح الداخلي للقشرة B ؟



2- ما هوالفيض الكهربي الناشئ عن الوجه الأيمن لمكعب طول ضلعه 2 إذا المجال الكهربائي المطبق $\underline{E} = -2x\underline{i} + 3y\underline{j}$ ؟



3- أوجد قيمة الجهد الكهربي عند نقطة الأصل الناشئ عن الشحنات الأربعة كما موضح بالرسم علما بأن $V = 0$ عند مالانهاية؟



4 - يُظهر الرسم البياني أن $V_S = 200\ V$ ، أوجد المركبة الأفقية للقوة التي تؤثر على بروتون موجود عند النقطة $x = 0.2\ m$ ؟