Name:

Physics 51
Homework #5
September 15, 2016

28-E2, SUP3

28-E2 Derive an expression for the work required by an external agent to put the four charged together as indicated in Fig. 28-28. Each side of the square has length a.

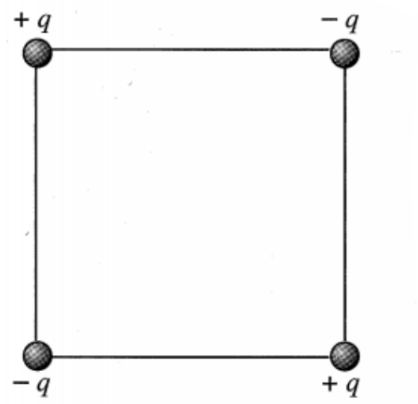

FIGURE 28-28. Exercise 2.

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SUP3 A coaxial cable consists of a long (infinite) cylindrical shell of radius A surrounded by another long cylindrical shell of radius B. The inner shell carries a uniform linear charge density of λ, while the outer shell carries a uniform surface charge density $-\lambda$. Considering a finite length L of the cable, find the energy per unit length stored in the electric field. From this deduce the capacitance per unit length (i.e. capacity to store charge or energy per unit length) of this device.

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