EP440: ENGINEERING ELECTROMAGNETICS
Fall 2014, J. B. Snively
Homework #4: Due 10/3/2014 at 5:00

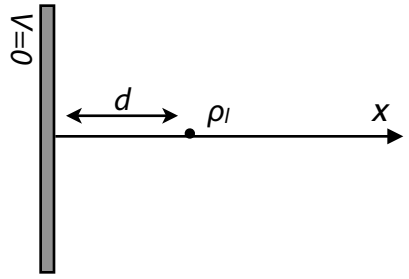
For this assignment... Work out the following problems on separate sheets. Staple all, including this front page, for your submission.

1) Cheng Problem P.3-40.

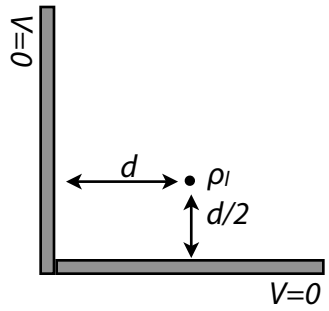
2) Cheng Problem P.3-44 (b).

3) Cheng Problem P.4-1, but please change the thickness to 3*d*/4 (i.e., 0.75d).

4) Line charge ρ_l is aligned in the *z*-direction at position *x*=*d* in the vicinity of an infinite conducting ground plane (at *x*=0). Find the surface charge density ρ_s on the plane, and demonstrate (by integrating over *y*) that this surface charge is equivalent to a line charge of $-\rho_l$ placed at *x*=-*d* also along the *z*-direction (Also, draw this).



5) Find the force on the charge ρ_l placed near two infinite, perpendicular, grounded, conducting plates. Draw on this figure the location of the three image *line* charges, and their respective signs.



6) Cheng Problem P.4-6.