Reading assignment
Paul, Whites, and Nasar, 3.11, 3.12
Connor and Salon, V-8 → V-27

Problem 1 - wire above conducting plane
A wire with a line charge of $\rho_l$ sits at a height $a$ above a grounded conducting plane.

In order to do this problem, you will need to use the potential of a isolated line charge which is given by $V = (\rho_l/2\pi\varepsilon) \ln(r_{ref}/r)$ where $r_{ref}$ is the distance between the line charge and the voltage reference.

a. What is the voltage in the problem with a line charge and the conducting plane?
b. What is the electric field just above the ground plane?
c. What is the charge density on the ground plane?