Special Problem 5-4.1

1. Two parallel conducting plates are located at plane $z = 0$ and at plane $z = -1$.

2. The plate located at $z = -1$ has an electric potential of $(13/12)$ V.

3. The plate located at $z = 0$ has an electric potential of 0 V.

4. The region between the plates is filled with charge. The density of this charge is:

   \[ \rho_z(\vec{r}) = \varepsilon_0 Z^2 \left[ \frac{\text{Coulombs}}{m^2} \right] \]

Find the electric potential function $V(z)$ for the region between the plates.

Determine the electric field in the region between the plates.