

10. (a)

$$W = \int_i^f q_0 \vec{E} \cdot d\vec{s} = \frac{q_0 \sigma}{2\epsilon_0} \int_0^z dz = \frac{q_0 \sigma z}{2\epsilon_0} .$$

(b) Since $V - V_0 = -W/q_0 = -\sigma z/2\epsilon_0$,

$$V = V_0 - \frac{\sigma z}{2\epsilon_0} .$$