Answers Test 2 2009

1. a) $i_2 = \dfrac{2V}{R_1 + \frac{R}{2}}$

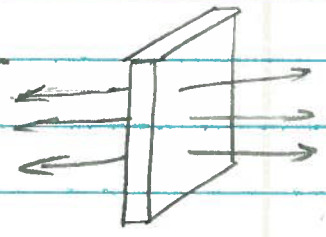
b) $i = \dfrac{2V}{R_1 + R}$; $Q = 2VC\dfrac{R}{R_1 + R}$

2. a) $\tilde{Q}_1 - \tilde{Q}_2 = C_1 V_1$

b) $\tilde{Q}_2 = (V_2 - V_1)\dfrac{C_1 C_2}{C_1 + C_2}$

3. a) $x < T/2 \quad E_1 = \dfrac{\rho x}{\varepsilon_0}$

$x > T/2 \quad E_2 = \dfrac{\rho T}{2\varepsilon_0}$



b) $V\left(L + \frac{T}{2}\right) - V(0) = -\dfrac{\rho T^2}{8\varepsilon_0} - \dfrac{\rho T}{2\varepsilon_0} L$

4. a) $j = \dfrac{i}{2\pi r w}$ radially out

b) $V(a) - V(b) = \dfrac{\rho i}{2\pi w} \ln \dfrac{b}{a}$

c) $R = \dfrac{V}{i} = \dfrac{\rho}{2\pi w} \ln \dfrac{b}{a}$