(1) $R = 0.025\ m$

$\sigma = 3.6\ \mu C/m^2$

a) $x = 0.01\ cm = 10^{-4}\ m$

$E \simeq \frac{\sigma}{2\varepsilon_0} = \frac{3.6\times10^{-6}}{2\times8.85\times10^{-12}} \simeq 0.203\ MV/m$

$E = \frac{\sigma}{2\varepsilon_0}\left(1 - \frac{1^2}{\sqrt{(0.025^2+(10^{-4})^2}}\right) \simeq \frac{\sigma}{2\varepsilon_0} \cdot 0.996 \simeq 0.202\ MV/m$ } molt semblants

b) $x = 4\times10^{-4}\ m$

$E \simeq \frac{\sigma}{2\varepsilon_0} \simeq 0.203\ MV/m$

$E = \frac{\sigma}{2\varepsilon_0}\left(\quad\right) = \frac{\sigma}{2\varepsilon_0} 0.984 \simeq 0.198\ MV/m$ } semblants

c) $x = 5\ m$

$E \simeq \frac{1}{4\pi\varepsilon_0}\frac{\sigma A}{x^2} = K\frac{\sigma\pi R^2}{x^2} = 9\times10^9 \cdot \frac{3.6\times10^{-6}\times\pi\ 0.025^2}{5^2} \simeq 2.54\ V/m$

$E = \frac{\sigma}{2\varepsilon_0}\left(1 - \frac{5}{\sqrt{0.025^2+5^2}}\right) \simeq 2.54\ V/m$ igual aproximat

d) No hi ha cap aproximació raonable i s'ha de calcular exactament

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(2) a) $R_\ell = \rho\frac{\ell}{A} = 1.72\times10^{-8}\cdot\frac{0.5}{\pi\left(\frac{0.6\times10^{-3}}{2}\right)^2} \simeq 30\ m\Omega$

b) $\varepsilon = 100\cdot\frac{0.03}{10} = 0.3\ \%$

c) $\Delta R = R_0(1+\alpha\Delta T)$ $\quad \Delta T = \frac{\Delta R}{\alpha R_0} = \frac{0.03}{4\times10^{-3}\cdot 10} = 7.5\ ^\circ C$

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(7) b) $\frac{\Delta B}{\Delta I} = 0.921\ T/A$ $\quad \frac{\Delta B}{\Delta I} = \mu_0\frac{N}{\ell}$ $\quad N \simeq 139\,000$ espires