# Topic 03. Electricity and Magnetism. Part 1

1. $\vec{E} = 2.7\vec{i} - 3.6\vec{j},\ E = 4.5\,kV/m$
2. $E = \frac{q}{2\pi^2\varepsilon_0 R^2} = 0.10\,kV$
3. $E = \frac{3qR^2}{8\pi\varepsilon_0 z^4}$
4. $\vec{E} = 2axy\vec{i} + a(x^2 - y^2)\vec{j}$
5. $V = \frac{\mathcal{E}}{1+3\eta+\eta^2} = 10\,V$
6. $U = \frac{q^2(\sqrt{2}-4)}{4\pi\varepsilon_0 a}$
7. $E \approx \frac{6qd^2}{4\pi\varepsilon_0 z^4} = \frac{3Q}{4\pi\varepsilon_0 z^4}\ (Q = 2qd^2)$