Worksheet 1: The $\vec{E}$ Field

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1 Understanding $\vec{E}$

(a) Describe, in as much detail possible, what an electric field ($\vec{E}$) is. What are the units of the $\vec{E}$ field? What is the equation that governs the $\vec{E}$ field? Units? What are some other examples of fields in physics? Similarities/differences?

(b) An electron experiences a force of magnitude F when it is x distance away from a very long, charges wire with a linear charge density λ. If the charge density is doubled, at what distance from the wire will a proton experience a force of the same magnitude F?

2 The Electric Dipole $\vec{p}$

3 Charged Particle Field Interaction

An electron is at the origin at $t = 0$ with an initial velocity $\vec{v} = 2\vec{x} + 1\vec{y}$ m/s, moving through a uniform electric field $\vec{E} = 3\vec{y}$ N/C. What is the electron's position at $t = 5$ s?