

Physics 123 Lab 2 Homework: Electric Field

Physics 123: Electricity and Magnetism

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1. A little known unit of electric charge is the Bloobit. A probe charge of -2 Bloobits is placed at location $x = 0$ on the x -axis. An ACME force probe is used to find that the probe charge experiences a force of 0.86 N in the $+x$ -direction due to a set of nearby source charges.
 - a. Find the magnitude and direction of the electric field at location $x = 0$. Don't forget to include units in your answer. Explain and/ show your work.
 - b. The -2 Bloobit probe charge is removed, and replaced with a probe charge of 6 Bloobits. How, if at all, does this affect the *electric field* at location $x = 0$? Explain.
2. A small ball with $+3$ -units of charge produces an electric field of magnitude E_0 at a distance d away. Suppose that $+7$ -units of charge are then *added* to the ball.

At what distance from the ball will the field now have magnitude E_0 ? Give your answer in terms of d . Explain your reasoning and show your work.

In addition to these postlab questions, complete a 1-page minireport describing your work on the Synthesis Challenge. For information about the mini-report, refer to the lab syllabus. It must be no longer than 1 page, and specific enough that another lab group could reproduce your work and verify your results.