Thursday Reading Assessment: Review of Electric Fields and Scaling Problems

Prof. Jordan C. Hanson

February 17, 2022

1 Memory Bank

- $\vec{E} = kq/r^2\hat{r}$ ...The electric field of a point charge.

2 Balancing Electric Fields

1. Suppose a charge q_1 is positive and located at the origin. Suppose another charge $-q_2$ is negative, and located a distance x_0 to the right of the origin. Where can a third charge be placed such that the net force on it is zero? (Assume $q_1 = 5\mu$C and $-q_2 = -3\mu$C, and $x_0 = 0.25$).

2. Suppose we observe a charge $2q$ from a distance r. Let the E-field observed be E_0. Which of the following is the new E-field if we change the distance to $2r$, but the charge changes to $4r$?

   - A: $\frac{1}{2}E_0$
   - B: E_0
   - C: $2E_0$
   - D: $\frac{3}{2}E_0$