

1 Electric Field of a Finite Line

Consider the finite line with a uniform charge density from class.

- (a) Write an integral expression for the electric field at any point in space due to the finite line. In addition to your usual physics sense-making, you must include a clearly labeled figure and discuss what happens to the direction of the unit vectors as you integrate. Consider the finite line with a uniform charge density from class.
- (b) Perform the integral to find the z -component of the electric field. In addition to your usual physics sense-making, you must compare your result to the gradient of the electric potential we found in class. (If you want to challenge yourself, do the s -component as well!)