You have a volume charge density given by  (where  is a constant, and refers to the usual Dirac-delta function).

What are the units of the constant ?

Describe in words, briefly but clearly, what physical situation this volume charge density represents.

Write a formula for the volume charge density of an electric charge +q located at position using Cartesian coordinates,

 

Suppose you have a uniform surface charge density confined to the x-y plane  (think of an infinitely ultra-thin flat sheet of charge at z = 0).  Consider the electric field at point x, y, z.  By symmetry arguments ONLY (no Gauss' law calculation here!) what direction could it point?

Please choose ALL that apply:

a) +x-hat e) -y-hat

b) +y-hat f) -z-hat

c) +z-hat g) None of the above

d) -x-hat

By symmetry arguments ONLY, what variable(s) (x, y, and/or z) could the E field depend on?

Please choose ALL that apply:

a) x c) z

b) y d) None of the above

Please explain your answer: