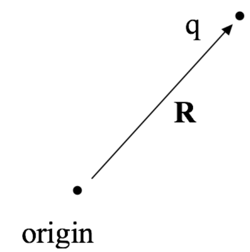
Compute:

$$\int_{-\infty}^{\infty} x^2 \delta(3x+5)dx$$

A. 25/3
B. −5/3
C. 25/27
D. 25/9
E. Something else

A point charge (q) is located at position $\mathbf{R}$, as shown. What is $\rho(\mathbf{r})$, the charge density in all space?

A. $\rho(\mathbf{r}) = q\delta^3(\mathbf{R})$
B. $\rho(\mathbf{r}) = q\delta^3(\mathbf{r})$
C. $\rho(\mathbf{r}) = q\delta^3(\mathbf{R}-\mathbf{r})$
D. $\rho(\mathbf{r}) = q\delta^3(\mathbf{r}-\mathbf{R})$
E. Something else??



What are the units of $\delta(x)$ if x is measured in meters?

A. $\delta(x)$ is dimension less (‘no units’)
B. [m]: Unit of length
C. [m^2]: Unit of length squared
D. [m^{-1}]: 1 / (unit of length)
E. [m^{-2}]: 1 / (unit of length squared)

What are the units of $\delta^3(\mathbf{r})$ if the components of $\mathbf{r}$ are measured in meters?

A. [m]: Unit of length
B. [m^2]: Unit of length squared
C. [m^{-1}]: 1 / (unit of length)
D. [m^{-2}]: 1 / (unit of length squared)
E. None of these.

What is the divergence in the boxed region?

A. Zero
B. Not zero
C. ???