

5.73

Quiz 5

$$\delta(a(x-b)) = \frac{1}{|a|} \delta(x-b).$$

$$\delta(g(x)) = \sum_i \left| \frac{dg(x_i)}{dx} \right|^{-1} \delta(x-x_i); x_i \text{ are zeroes of } g(x).$$

$\delta'(x-d)$ means derivative of δ -function evaluated at $x=d$.

$$\text{Infinite box of width } L: E_n = \frac{n^2 h^2}{8mL^2}, k_n = \pm \frac{n\pi}{L}, n = 1, 2, \dots$$

1. $f(x) = (x-3)(4x+8)$

A. Evaluate $\int \delta(x-d)f(x)dx$.

B. Evaluate $\int \delta'(x-d)f(x)dx$.

C. Express $\delta(f(x))$ in terms of $\delta(x-x_i)$.

2. Density of States.

A. Compute $\frac{dn}{dk}$.

B. Compute $\frac{dn}{dE}$.

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