Physics 491: Recitation #4
September 11, 2015

1. Prove
$$\langle k' \rangle \, k = \delta(k' - k)$$

2. prove that the delta function is even.
$$\delta(x) = \delta(-x)$$
.

3. Consider a reprsentation of the delta function that is the limiting case of a Gaussian as σ goes to zero. Then the derivative of the Gaussian is an odd function. Prove that the derivative of the delta function is odd.
$$\frac{d}{dx}\delta(x' - x) = -\frac{d}{dx'}\delta(x' - x)$$

4. Prove that
$$\frac{d}{dx}\delta(x' - x) = \delta(x' - x)\frac{d}{dx'}$$